PROBLEMATIC

PRE-SCHOOL SLEEPING AND FEEDING:

IS THERE A COMMON LINK?

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ABSTRACT

Problematic feeding and sleeping is an unrelenting issue for many parents. Research has identified that childhood obesity may be related to both areas. These are two aspects of development very heavily influenced by parents. This study therefore addresses the question "is there a relationship between problematic sleeping and feeding in infants?" It further considers whether parenting style is a common link between the two.

Nineteen parents of children aged between 18 and 48 months were interviewed about their parenting strategies in general, and more specifically about feeding and sleeping behaviours of their children. They also completed diaries and questionnaires. The data was analysed to ascertain whether there was a relationship between feeding and sleeping problems and whether these problems related to a number of parenting measures. Strategies utilised by parents to handle feeding and sleeping problems were also ascertained.

The sample that volunteered for this study did not report sleeping and feeding problems so information about these problems was derived from diary measures. Feeding and sleeping problems were evident on these measures and parents employed numerous different strategies to handle them. There was no difference evident in the strategies adopted by parents of preschoolers with and without sleep and feeding problems. There was no evidence that problems in sleeping and feeding were correlated and there were no correlations between feeding and sleeping problems and any of the other parental measures.

These questions may have been better studied in a clinical sample. Future research should address this and investigate the relationship between sleeping and feeding further in a sample including children displaying objectively defined problems in one or both areas.

CHAPTER 1. INTRODUCTION

Current research indicates that independently, problematic sleep and problematic feeding may increase the risk of childhood obesity. The current study will investigate the possibility of a relationship between problematic feeding and problematic sleeping in pre-school children, with a focus on parenting as a possible common link.

Infancy through to early childhood is a very precious developmental period, both physically and socially. As any physician or parent will confirm, adequate sleep quantity and the consumption of a nutritious diet, are two critical factors essential for successful physical growth. It is also well established that actions during this period, for example eating a varied diet and establishing good sleep habits, can set the precedence for the future health and development of the child (Schwartz & Puhl, 2003; Skinner, Carruth, Bounds & Ziegler, 2002).

In addition to the vast physical changes that take place, children begin to develop socially. There is increasing evidence that very young infants are able to learn the contingencies between their own responses and the consequences they produce (Reilly, Skuse & Wolke, 2006). Basically, children learn very quickly how to evoke certain responses to 'get what they want'. Parents therefore need to be very careful not to fall into coercive cycles with their children, which may inhibit the development of appropriate behaviours and may in fact lead to the development of problematic behaviours. For example, children may learn that by refusing certain foods they will be offered a tastier option or by crying continuously their mother will stay with them until they fall asleep. If these patterns are established, there is little reason for the child to eat

the less preferred meal or to fall asleep alone. Therefore, the way in which parents respond to their child's very early behaviours may set the precedent for future behaviours.

Prevalence rates of children experiencing problematic feeding or sleeping are quite high. Around 15% to 35% of young children are reported to experience sleep problems of some degree (France & Blampied, 1999) and around 25% of young children experience feeding problems (Chatoor, 2002, 2003). Due to the intricate relationship sleeping and feeding have with healthy physical growth, it is clear that any problems and possible causes of these problems should be addressed.

In addition to affecting physical growth and health, both inadequate sleeping and feeding, specifically reduced sleep duration and the development of poor eating habits in early life, have been linked with the increased risk of childhood obesity. This is of considerable concern because childhood obesity has been on a steady rise for the past few decades (Ogden, Flegal, Carroll, Johnson, 2002; Rhee, Lumeng, Appugliese, Kaciroti & Bradley, 2006). Concurrently, sleep patterns of infants, children and adults have altered. Specifically, sleep duration has declined. The rapid rise in obesity has received a multitude of attention both in the research arena and in society. People want to know what is leading to this alarming increase and whether there are any preventative measures that can be put in place to give their children a better chance of avoiding this problem. Through research, many risk factors, both environmental and biological, potentially leading to childhood obesity, have been proposed.

The current research aims to investigate whether both problematic sleeping and feeding may be related to parenting style. This will be achieved by focussing on sleeping and feeding in early life, both of which may be considered to partially comprise of learned behaviours, which although physiological in origin, can also be strongly influenced by parents. This research will be looking at the parents of typically developing young children, and parents with children who display feeding and or sleeping problems. Parenting attitudes and behaviours and their perspectives on matters surrounding feeding and sleeping will be assessed through questionnaires and interviews.

If it is found that parenting attitudes and behaviours are associated with both problematic sleeping and feeding, there will be implications for parent education and for the prevention of both problems.

The following section will provide a description of pre-school sleep and feeding and their common problems. Childhood obesity will also be discussed, with a focus on possible causes will also be discussed and following this, the recent findings relating short sleep duration in infancy and childhood obesity will be presented.

CHAPTER 2. REVIEW OF THE LITERATURE

Feeding: Infants and Young Children

Early nutrition can have a great influence over later eating habits largely due to preferences and habits that develop during this time. Research has indicated that infants who do not develop healthy preferences often continue to choose the less healthy options in childhood (Fisher & Birch, 1995). This may lead to over-consumption of food with high calorie-contents, which will increase the risk of developing obesity. Further, certain strategies used by parents may in fact hinder the development of appropriate eating behaviours.

Establishing healthy eating habits early on is an often difficult yet essential responsibility of parents. Ensuring adequate consumption of a nutritious diet is often a tough task, made even more so because infants have innate preferences for foods with high calorie content. Provision of preferred foods may seem the best option; however, data collected by Devaney et al. (2004) indicates that infants between four and eleven months were consuming excessive amounts of fats and carbohydrates. .

The term, feeding is generally used to describe the dyadic nature of eating in infants and young children (Chatoor, 2002). Adoption of the term 'feeding problem' indicates that the problem lies in the parent-child interaction rather than solely with the individual child (Kerwin, 2003). Success of the reciprocal relationship is therefore dependent on both parties. For the developing child, feeding serves a range of psychological and social functions in addition to the biological function. During early development many of the interactions between parent and child occur during feeding. As such it provides

opportunity for bonding and for the child to learn to rely on their parents to satisfy their hunger. In addition, feeding is often a communal event and it provides an opportunity for children to socialise while learning appropriate feeding behaviours (Cooper & Stein, 1992).

Feeding problems

Feeding problems can occur in a variety of children, including healthy and otherwise typically developing, delayed, and physically ill children. Severe problems, which will not be covered here, are often associated with serious health consequences, including little or no weight gain, weight loss, developmental delays and failure to thrive. These problems are frequently treated with medical intervention and often stem from physiological rather than behavioural issues (Birch & Fisher, 1997). Babbitt and colleagues (1994) described two major types of feeding problems. These are 1) motivational problems caused and maintained by faulty contingencies and lack of stimulus control and 2) Skill deficit problems involving physiological abilities. This research will focus on the first group and will include common feeding difficulties such as persistent food refusal, struggling or resisting during feedings, being a fussy eater and disruptive behaviour during meals (Lewinsohn et al., 2005; Sanders, Patel, Le Grice & Shepard, 1993; Wright, Parkinson, Shipton & Drewett, 2007). Such difficulties are rather common with an estimated 25% of typically developing infants and young children displaying feeding problems at some stage (Chatoor, 2002, 2003; Coolbear & Benoit, 1999; Galensky, Miltonberger, Stricker & Garlinghouse, 2001). Beautrais and colleagues (1982) estimated that 24% of 2 year-old, 19% of three year-old and 18% of typically developing four year-old children are reported by parents as having feeding problems. Such problems can place considerable stress upon the family and can lead to more severe

and persistent problems, for example fussiness or refusal of nutritious foods may increase the chance of weight gain if the child continues to only eat preferred foods, which often have high caloric content.

Development of feeding

During early infancy humans are nourished exclusively by milk or a substitute formula and as we develop we require additional nutrition, which is obtained through solid foods (Birch, 1999; Foote & Marriot, 2002; Skinner et al., 1997). Although the timing of weaning differs across cultures, the generally accepted age range for the introduction of solids is between four and six months (Birch & Fisher, 1997; Foote & Marriot, 2002; Hawdon, Beauregard, Slattery & Kennedy, 2000; Skinner et al., 1997) with the US nutritional guidance stating that by the second half of the first year, a diet consisting exclusively of milk will not adequately provide the nutrition a growing toddler requires, and as such, solids should be introduced (Birch, 1999).

Although the introduction of solids is a natural progression for a young child, this milestone does not always occur smoothly. The majority of children will progress gradually, yet successfully and their diet will expand and diversify. However, some children will resist and or refuse novel flavours and textures, making the feeding process rather laborious. Initial hesitancy or refusal to consume novel foods is natural and is termed food neophobia (Barnett, 1975). This response has been proposed as a protective function; is less developed in young infants; rises dramatically around the age of two; then declines thereafter (Adessi, Galloway, Visalberghic & Birch, 2005; Birch, 1999). In addition, this response may be moderated to an extent by parent behaviour (Birch, 1999;

Birch, Gunder, Grimm-Thomas & Laing, 1998; Foote & Marriott, 2002; Sullivan & Birch, 1994).

In addition to neophobia, infants have an inherent preference for sweet and salty tastes and tend to reject sour, bitter and nutrient-dense foods in preference for energy-rich foods high in fat and carbohydrates (Birch, 1999, Skinner et al., 1997). Thus parents have an additional hurdle to ensure adequate nutrition is consumed. The 2002 Feeding Infants and Toddlers Study looked at nutrient intake of 3022 children aged between 4 and 24 months. Descriptive data from this study showed that while ingestion of the micronutrients was adequate, infants between four and 11 months were consuming excessive amounts of fats and carbohydrates, with children from as low as the 25th percentile consuming more than the adequate intake (Devaney et al., 2004). Provision of such foods may be due to fussiness or food refusal from their child. When children present with neophobia, it is possible for parents to choose to feed their child preferred flavours, which are generally high in calories, in an attempt to satisfy their child's hunger. Although this may have the positive immediate result of a full child, without being continually exposed to new and nutritious flavours the child will not develop preferences for these and will continue to choose the less nutritious foods later in life, which will lead to weight gain (Fisher & Birch, 1995).

Parent Strategies for Feeding

Two primary goals for infants during the transition to solids are to overcome food neophobia and to accept a varied diet. How successfully these are achieved appear to be influenced by management strategies parents engage in. Common strategies used by parents include; repeated exposure (Birch, 1999; Birch, McPhee, Steinberg & Sullivan, 1990; Sullivan & Birch, 1994), controlled and restrictive feeding (Birch & Fisher, 1997; Gable & Lutz, 2000; Schwartz & Puhl, 2003) and the use of food as a reward (Baughcum, Burklow, Deeks, Birch & Fisher, 1997; Birch, Zimmerman & Hind, 1980; Newman & Taylor, 1992; Powers & Whitaker, 1998; Schwartz & Puhl, 2003). Many of the strategies engaged in can be considered coercive and thus there is the potential of falling into coercive cycles, which may actually worsen the problematic behaviours (Piazza et al., 2003; Sanders et al., 1993). Research has indicated that certain strategies are more beneficial than others and some may actually hinder the establishment of healthy eating patterns and subsequently increase the risk of later obesity.

Repeated Exposure. Repeated exposure is a common strategy where by the parent continues to offer a food to their child over a period of time, in order for their child to develop a preference for it. Neophobia is generally reduced and preferences steadily increase with this strategy. Birch and colleagues (1998) discovered that when young children are given opportunities to try new foods, their preferences increased with frequency of exposure in a steady linear pattern, suggesting that even few exposures can produce increases in consumption.

Exposure to a varied diet in infancy has been seen to influence food intake in later childhood, and more specifically, infants who were exposed to a variety of foods

consumed more novel foods on first introduction in early childhood (Schwartz & Puhl, 2003; Skinner, Carruth, Bounds and Ziegler, 2002). Skinner and colleagues (2002) found that food related experiences (fruit and vegetable variety and exposure) in the first two years of life can influence dietary variety in six to eight year olds (Skinner, Carruth, Bounds, Ziegler, Reidy, 2002). Fisher and Birch (1995) also showed that children who developed preferences for high fat foods when they were young were more likely to choose high fat options in later childhood, which can lead to weight gain, indicating the importance of early exposure and the development of preferences.

Restrictive and controlling feeding. Restrictive and controlling strategies are often engaged in when parents feel the need to carefully monitor and control their child's nutritional intake. Research has consistently shown that infants are able to self-regulate their dietary intake in relation to changes in energy-density of their food (Birch & Fisher, 1997; Kerwin, 2003) and excessive control over food consumption has been linked with children's impaired ability to self-regulate (Birch & Fisher, 1997). A parallel relationship between parental control and children's ability to self-regulate has been identified and findings indicate that children's responsiveness to energy density is diminished when parents focus on external cues to control eating, for example eating until your plate is empty (Birch & Fisher, 1997; Cathey & Gaylord, 2004). Such external control is associated with increased risk for childhood overweight and obesity, due to the child losing their innate ability to regulate their own intake by recognising cues of hunger and satiety (Gable & Lutz, 2000).

Restrictive feeding occurs when certain foods are not allowed or are severely limited. The restricted foods are generally high in fat and or sugar, and thus this strategy may seem beneficial, however, this strategy has been shown to have negative long-term

effects. Children develop increased preferences for the restricted foods and their dislikes, generally the food they are highly encouraged to consume, become more prominent. This strategy has also been linked with an increased consumption of restricted foods while in an unrestricted setting, which is related with low self-regulatory abilities (Birch & Fisher, 1997; Schwartz & Puhl, 2003).The pattern of creating greater preferences for the restricted food and eating more in unrestricted settings has the potential to lead to weight gain.

Reward feeding. Reward feeding or using food to shape behaviour is reported by parents as being very common and may often produce immediate, positive results. However, the long-term effects of this strategy seem to be far less appealing. Baughcum and colleagues (1998) looked at maternal feeding practices and childhood obesity and found 'Using food to shape behaviour' to be a common theme. Rewarding children with food when they are not hungry may weaken their internal cues for hunger and reduce their ability to self-regulate (Birch & Fisher, 1997; Schwartz & Puhl, 2003). Reward feeding also tends to increase preferences for the reward item, which is generally a treat food of low nutritional value. In addition, when a treat is used as a reward for consuming a less favourable food, the target item tends to become more disliked and thus promoting consumption will become more of a struggle (Baughcum et al., 1998; Birch & Fisher, 1997; Birch et al., 1980; Newman & Taylor, 1992; Schwartz & Puhl, 2003). Children may learn to associate food with behaviour rather than as a tool to reduce feelings of hunger. With a reduced ability to self-regulate and consuming when they are not hungry, children may tend to over-eat, which will lead to weight gain.

Coercion. Many of the above behaviours can be considered coercive as they involve an aversive act and the formation of a contingency. Coercive techniques may serve to

alleviate or resolve immediate problems; however, they often worsen the problematic behaviour in the long run by creating a cycle of anticipated behaviour (Piazza et al., 2003; Sanders et al., 1993). This cycle has been coined the coercion trap. Within this trap, each person is trying to avoid an aversive event or behaviour (France & Blampied, 1999). For example, a food refusal coercion trap (Figure 1) can be seen when a mother provides a nutritious meal of pumpkin and chicken for her child, but the child desires a sweet and tasty option of banana and custard. To avoid eating the nutritious and possibly not so palatable option, the child may act out and refuse to eat. To eliminate or minimise this aversive behaviour, the mother may provide the child with the preferred option of custard and banana. The child will learn that in order to receive a tasty option, he or she must refuse the first option and cry. Meanwhile the mother learns that to avoid a stressful meal time, she needs to provide her child with their preferred option. Although the mother avoided a stressful meal, the long-term goal of getting the child to eat a varied, healthy diet has not been achieved and perhaps has been pushed further away. Coercive behaviours can be very persistent and the trap is easily formed. This occurs because the response, for example, the provision of preferred foods, reinforces the initial coercive behaviour.

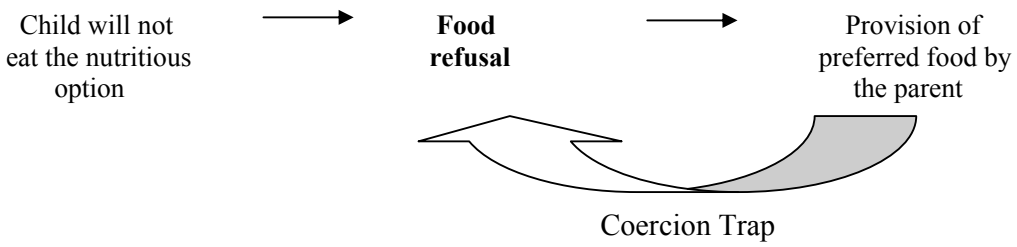

Figure 1. Coercion Trap: Food Refusal

Sanders and colleagues (1993) completed an observational analysis looking at feeding interactions of problem eaters and non-problem eaters. In this study parents of problem eaters were more likely to engage in unsuccessful coercive management methods, which ultimately lead to the persistence of the child's feeding problems. The observations showed that as coercive techniques were used, the children engaged in more disruptive behaviours such as continued food refusal, which subsequently lead to the escalation of coercive techniques.

Piazza and colleagues (2003) also completed a functional analysis of inappropriate mealtime behaviours on children with feeding problems. Results from initial observations showed that a coercive cycle was witnessed in the majority of interactions between parents and their problem-eaters. The functional analysis provided some support for the hypothesis that feeding problems are maintained by negative reinforcement, with 90% of the children demonstrating sensitivity to escape. In addition, positive reinforcement contributed to the maintenance of inappropriate mealtime behaviours in over 50% of the children. It appears that young children quickly learn to display certain behaviours in order to receive the desired response, such as the removal of food or provision of a toy or preferred food item. Thus, undesirable eating habits, such as being very fussy, can be maintained by falling into coercive cycles and can remain during

childhood. This may have a negative effect on the child's health and weight management due to the possibility of receiving inadequate or excessive nutrition.

Summary

Feeding of infants and young children is a complex process that requires co-operation from both parties for the reciprocal relationship to be successful. In response to the introduction of solids, many children may display food refusal or excessive food neophobia. Parents have the responsibility to support healthy eating and encourage appropriate behaviour during mealtimes. Many strategies are engaged in, as parents endeavour to promote the consumption of adequate nutrition.

Repeated exposure appears to be the failsafe strategy for establishing good eating habits in infants and young children. Parents should persist in offering initially rejected foods, to allow their child the opportunity to develop preferences. It is important to persist with repeated exposure and not to offer preferred foods every time the target item is refused. If the child receives a preferred food, they will learn to refuse until they receive the more palatable item, and thus a coercive cycle will form. Other common techniques including restrictive and controlling strategies, and using food as a reward have been found to actually hinder the development of healthy eating habits and may lead to the increased risk of weight gain (Birch & Fisher, 1997; Gable & Lutz, 2000; Schwartz & Puhl, 2003). The above strategies can all be considered coercive, and thus when using these techniques, parents have the potential of falling into the coercion trap, which generally worsens the problematic behaviours.

Early nutrition has an important role to play in establishing healthy eating habits and promoting healthy growth. Development of negative habits may lead to unhealthy eating

habits and subsequent future weight gain. Parents have a large role to play in establishing appropriate behaviours.

Sleeping: Infants and Young Children

'Sleep is a seizure of the primary sense-organ, making it incapable of activity. It occurs of necessity and is for the sake of the animal's preservation.' (Aristotle 350 BC). Many philosophers, psychologists and scientists have endeavoured to define what it is that sleep does, or in fact what sleep actually is, however, more than 2000 years after Aristotle's proclamation, researchers are yet to definitively state the basic function of sleep.

The majority of what we do know about sleep has arisen from studies looking at induced sleep deprivation that generally focus on cognitive, physiological and immunological consequences (Davis et al., 2004). Such studies have identified a role for sleep in the growth and healing of bodily tissues, autonomic functioning, and CNS repair, the processing of memory (Davis et al., 2004) and overall health and wellbeing (Segovia, Bartlett & Edwards, 1989; Shaver & Paulson, 1993). More specifically sleep deprivation has been linked to cardiovascular disease (Appels et al., 1987; Naitoh, Kelly & Englund, 1990), impaired immune functioning (Hall, et al., 1998) and mortality (Kojima et al., 2000; Wingard, Berkman & Brand, 1982). Recently, short sleep duration in infancy has also been linked with the increased risk of obesity (Agras, Hammer, McNicholas & Kraemer, 2004; Knutson et al, 2007; Mamun et al, 2007; Reilly et al, 2005; Taheri, 2006; von Kries et al, 2002).

Infant Sleep

It would appear that sleep is particularly important during early brain development as indicated by greater sleep requirements during infancy (Dahl, 1998; Davis et al., 2004). By two years of age, a child has spent approximately 10,000 hours asleep and around 7,500 hours awake. The full-term newborn will typically sleep for 16 to 18 hours a day for periods of 2 ½ to 4 hours (Davis, 2004). Nearing 12 months of age, sleep requirements decrease to around 14 to 15 hours per day (Davis et al., 2004). As the child continues to grow, required sleep duration continues to decrease to about 13 hours at 2 years, 12 hours by three to four years, and 11 hours by the time the child reaches 5 years of age and is largely consolidated during the night (Davis, 2004).

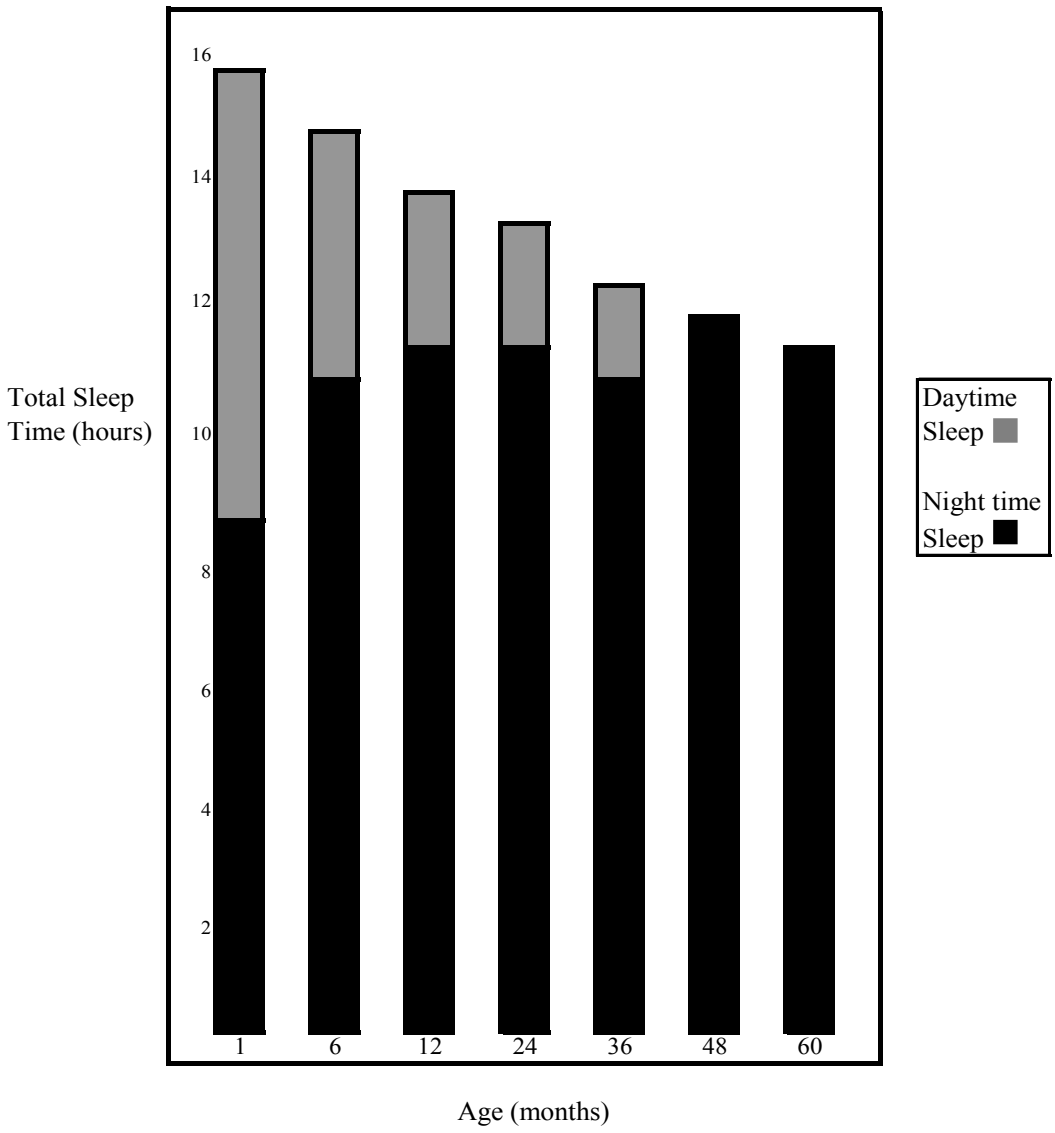

Figure 2. Average total daily sleep requirements for infants and young children. Ferber and Kryger [Eds.] (1995).

Not only do infants and young children sleep for greater lengths of time, but they spend almost equal amounts of time (55%) in REM (rapid eye movement) sleep as they do in NREM (non rapid eye movement) sleep (Davis et al., 2004), (see Figure 3). By five years of age the proportion of REM sleep has declined to about 20% to 25% of total sleep (Anders, Sadeh & Appareddy, 1995). Interestingly, EEG analyses and video footage shows that REM sleep frequently precedes arousal. Thus by spending greater

proportions of time in this state, infants and young children are more vulnerable to waking regularly, whether completely or partially (France & Blampied, 1993).

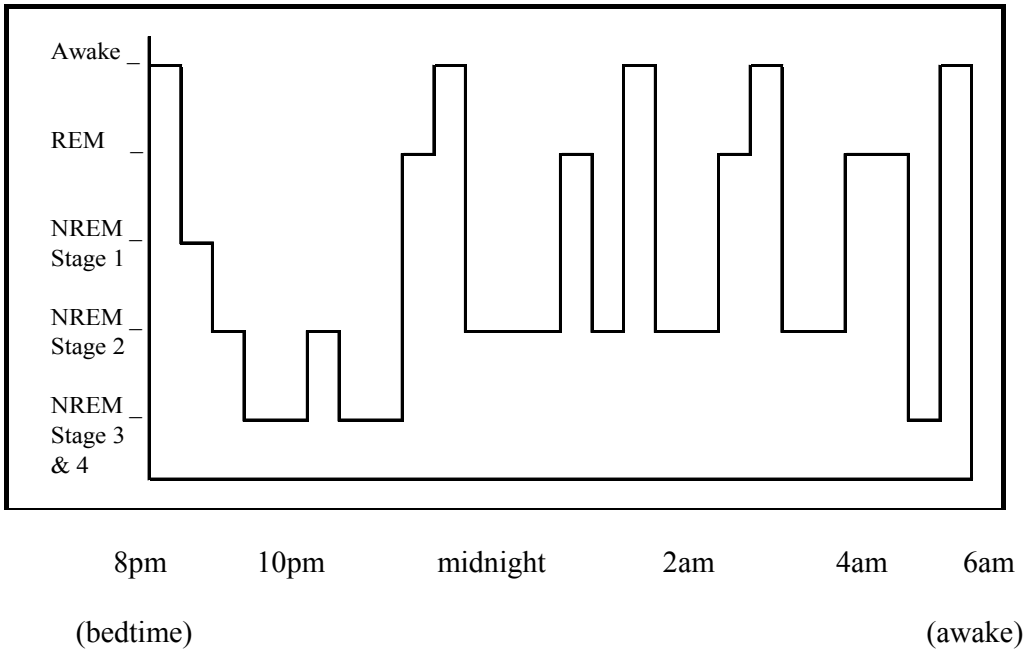

Figure 3. Typical night-time sleep pattern in a young child (Davis et al., 2004).

Problematic and Restricted Sleep

Sleep problems are experienced by 15% to 35% of young children aged between 6 and 24 months (France & Blampied, 1999). The research to date has identified short sleep duration as a potential risk factor for obesity and as such, this research will be concerned with sleep disturbances that decrease sleep quantity.

Sleep problems are generally placed into one of two categories; parasomnias or dyssomnias. For the purpose of this research, two disturbances from the dyssomnia family will be focussed on. These are sleep-onset association disorder and limit-setting

sleep disorder as these are the most common sleep related problems, which decrease sleep duration in pre-school children.

Sleep-onset Dissociation Disorder. Sleep-onset association disorder covers the lack of self-soothing at sleep initiation and following awakenings during the night. Night awakenings in infants and young children are very common and can occur between five to eight times per night (Dahl, 1998). This in itself is not a problem as the majority of infants learn to self soothe when they wake and do not require intervention. Thiedke (2001) stated that almost all newborns (95%) will cry after night-time awakenings and will require parental presence before resuming sleep, but by one year of age, 60% to 70% of infants will be able to self-soothe if given the opportunity.

Ferber (1985) has described two types of night arousals; partial and complete. A partial arousal occurs when the infant is seemingly unaware of the awakening and resumes sleep without intervention. Conversely, complete arousals occur when the infant cries out or signals to parents and an intervention is required to reinitiate sleep. Due to the fact that children will generally wake several times during the night, this in itself is not the problem. The feature separating a child displaying typical sleep and a sleep disturbed child is their ability to reinitiate sleep following these normal awakenings (Ferber, 1985; Ragins & Schachter, 1971). As such, Ferber and Boyle (1983) emphasise that sleep initiation and re-initiation rather than difficulty with sleep maintenance is the problem.

According to Ferber (1996), it appears that parents may unintentionally train their children to expect certain conditions when they fall asleep. Ragins and Schachter (1971) went on to state that infants may come to rely on specific conditions prior to falling

asleep and will often require these conditions to return to sleep during the night, rather than engaging in self-soothing behaviours. Davis and colleagues (2004) supported this notion and stated that infants who fall asleep on their own develop the ability to put themselves back to sleep upon waking during the night.

*Limit-setting Sleep Disorder. L*imit-setting sleep disorder covers the other very common problem parents often face with young children – bedtime resistance. Although this may appear to be a relatively minor problem initially, it can cause considerable tension within family relationships and may cause behavioural issues the following day due to the child not obtaining enough sleep. Pre-schoolers often make excessive demands at bed-time in an attempt to prolong their time spent out of bed. Requests for more stories, a drink of water or cuddles are common and can make bed-times inconsistent (Davis et al., 2004). Ferber (1994) considers this to be a result of poor limit setting by the parents. This type of resistance can often lead to delayed bedtime, which is classified as taking longer than 20 minutes to fall asleep after going to bed (Owens, Spirito, McGuinn & Nobile, 2000).

Sleep as Behaviour

It is possible for sleep itself to be viewed as a biobehavioural state (Thoman, 1990), therefore, infants and young children need to be taught how to establish good sleep habits and how to resume sleep following waking during the night, much as they would learn other developmental milestones such as feeding. Bootzin (1977) suggested that falling asleep is the operant behaviour emitted to produce sleep, which in turn becomes the reinforcer of falling asleep (Figure 4). For the end result of sleep to occur reliably, Bootzin (1977) stated that the operant chain of bedtime preparation needs to come under

the control of certain discriminative stimuli, both internal and external cues. He also stated that if these discriminative stimuli are not present, the child may be affected by sleep initiation difficulties. For example, before entering into sleep, behavioural quietude is required, which is followed either by reduced interaction from parents or continued interaction, possibly in the form of rocking or lying next to the child. The child will inevitably learn to fall asleep in this state. During the night if the child wakes, they will want to re-enact the process of how they fell asleep, either alone or with a parent present. The acts preceding sleep appear to have a large influence over the end goal of entering sleep. Therefore, interactions between the parent and child, during sleep preparation are very important.

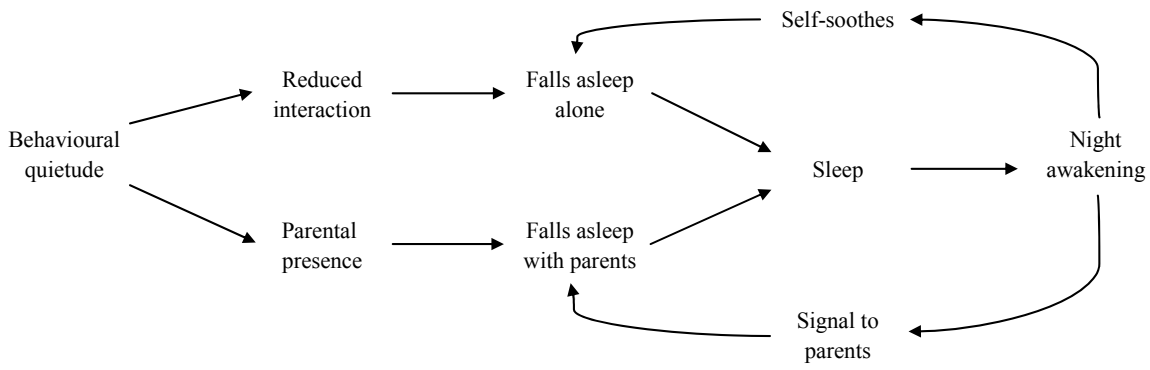

Figure 4. Possible operant chain for sleep initiation and re-initiation.

As sleep is a desired event and a reinforcer for both parent and child, it is not surprising that the behaviours which precede sleep are likely to increase (France & Blampied, 1999). An infant, who displays good sleep, will be reinforced by engaging in behavioural quietude and the parents will be reinforced for providing appropriate discriminative stimuli, including not over-stimulating the child prior to bed-time. Self-soothing behaviours by the child and non-reinforcing behaviours by the parents will be reinforced

by sleep during sleep initiation and following night awakenings (France & Blampied, 1999).

On the contrary, a sleep-disturbed infant who relies on parental presence to fall asleep will be reinforced for signalling to parents with the eventual onset of sleep, and parents will be reinforced for providing inappropriate cues (France & Blampied, 1999). The child may become reliant on parental presence to enter and reinitiate sleep and these behaviours may become strongly reinforced in a coercion trap (Figure 5) (France & Blampied, 1999). The coercion trap occurs when two parties are attempting to avoid an aversive act or behaviour. At bedtime, the child may wish to avoid falling asleep alone and will cry out. The parent will wish to avoid the distressful behaviour of their child and may stay with the child or bring the child with them to their bed (France & Blampied, 1999). Both parties have successfully avoided the aversive acts and are reinforced by eventual sleep. However, the end goal of establishing self-soothing behaviours is pushed further away. This trap is something that can occur very quickly and escalate rapidly, making it very difficult to break.

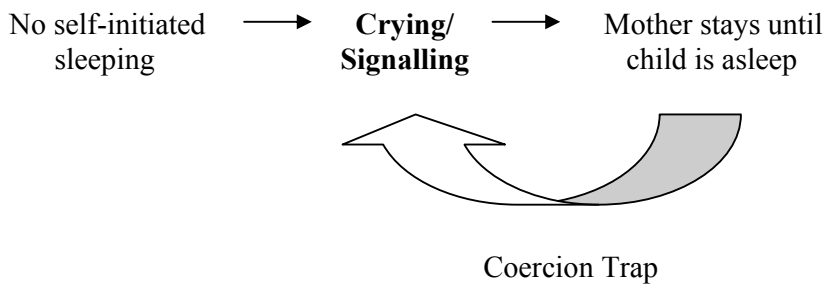

Figure 5. Coercion trap: Sleep Initiation.

Recent research has identified that in addition to early nutrition and other biological and environmental factors; short sleep duration may increase the risk of later obesity. Thus, it is imperative to establish good sleep habits in young children. Because sleep is considered to be a partially learned behaviour, parents have a prominent role to play in establishing these good behaviours. As children are able to learn contingencies from a very young age, it is critical for parents to endeavour to avoid becoming trapped in destructive coercive cycles, which may in fact hinder the development of appropriate behaviours.

Childhood Obesity

The prevalence of childhood overweight and obesity continues to increase with global rates almost tripling over the past three decades (Ogden, Flegal, Carroll, Johnson, 2002; Rhee et al., 2006). Results from the 2002 New Zealand National Children's Nutrition Survey illustrate that this rapid rise has not bypassed New Zealand children. The national report identified that around one-fifth and one-tenth of 5-14 year olds are overweight and obese respectively (Parnell, Scragg, Wilson, Schaff & Fitzgerald, 2003). This dangerous increase is taking a heavy toll on children, having both immediate and chronic adverse effects on their health and well-being (Daniels, 2006).

Childhood obesity significantly increases the risk of cardiovascular disease, metabolic disorders such as insulin resistance and type 2 diabetes, as well as gastrointestinal and pulmonary disorders (Agras et al, 2004; Daniels, 2006; Kitzmann, Dalton & Buscemi, 2008; Knutson et al, 2007; Mamun et al, 2007; Taheri, 2006). Obese children are not limited to suffering physical illness. Many also suffer psychological and social pressures. In later childhood, children associate being overweight with poor social functioning, impaired academic ability and lowered fitness and health (Hill & Silver, 1995). All of which make the child less desirable to their peers.

Table 1

Disorders Related to Childhood Obesity, by Body System.

System and disorder	Explanation	Estimated prevalence in pediatric populations
Cardiovascular		
Hypertension	High blood pressure	2–4%
Left ventricular hypertrophy	Increased thickness of the heart's main pumping chamber	Unknown
Atherosclerosis	Hardening of the arteries	50% (fatty streaks) 8% (fibrous plaques) 4% (>40 in those with stenosis)
Metabolic		
Insulin resistance	The process in which the action of insulin is retarded	Unknown
Dyslipidemia	Abnormal changes in cholesterol and triglycerides (fats) in the blood	5-10%
Metabolic syndrome	Constellation of risk factors including increased waist circumference, elevated blood pressure, increased triglyceride and decreased HDL-cholesterol concentrations, and raised plasma glucose	4% overall, 30% in obese
Type 2 diabetes	A condition in which the body either makes too little insulin or cannot properly use the insulin it makes, leading to elevated blood glucose	1–15 persons per 100,000 overall, almost all in obese
Pulmonary		
Asthma	A chronic inflammatory pulmonary disorder characterized by reversible obstruction of the airways	7–9%
Obstructive sleep apnea	A breathing disorder characterized by interruptions of breathing during sleep	1–5% overall, approx. 25% in obese
Gastrointestinal		
Nonalcoholic fatty liver disease	Fatty inflammation of the liver not caused by excessive alcohol use	3–8% overall, 50% in obese
Gastroesophageal reflux	Backward flow of stomach contents into the esophagus	2–20%
Skeletal		
Tibia vara (Blount disease)	Bowing of children's legs caused by a growth disturbance in the proximal tibial epiphysis	Uncommon
Slipped capital-femoral epiphysis	A disorder of the hip's growth plate	1–8 persons per 100,000
Psychosocial		
Depression	A mood disorder characterized by sadness and loss of interest in usually satisfying activities	1–2% in children, 3–5% in adolescents
Other		
Polycystic ovary syndrome	A constellation of abnormalities including abnormal menses, clinical manifestations of such androgen excess as acne and excessive growth of hair, elevated levels of circulatory androgens, and polycystic ovaries on ultrasound evaluation	Unknown in adolescents, 5–10% in adult women
Pseudotumor cerebri	Raised intracranial pressure	Rare

Source: Author's estimates based on various sources.

(Daniels, 2006)

Potential Risk Factors

Due to the very serious nature of obesity, it is not surprising that many researchers have attempted to cast light upon the possible origins and risk factors that may contribute to the development of childhood obesity. Substantial literature indicates that early development sets the precedent for childhood growth and obesity, with both biological and environmental aspects being identified as potential risks.

Genetic Make-up and Hormones. At the most primary level, our DNA has been the base of many obesity studies. Twin research suggests a heritability of fat mass between 40% and 70%, with a concordance of 0.70-0.90 between monozygotic twins compared with 0.35-0.45 between dizygotic twins (Farooqi & O'Rahilly, 2000; Stunkard, Harris, Pederson & McClearn, 1990). Although many similarities between twins may be explained by environmental influences, a number of studies have described a closer relationship between the weights of adopted children and their biological parents, compared with their adopted parents (Farooqi & O'Rahilly, 2000; Ravussin & Swinburn, 1992). Further, several specific genes and gene sequences have been identified as being related to fat mass, specifically those involved in the regulation of appetite, energy expenditure, satiety and blood-sugar levels (Farooqi & O'Rahilly, 2000; Montague et al., 1997; Ravussin & Swinburn, 1992; Strauss & Knight, 1999; Stunkard et al., 1990). These genetic influences are not confined to the extremes of obesity, but their effects are seen across the entire range of body weight (Farooqi & O'Rahilly, 2000).

Genes related to blood-sugar levels have been identified as being closely associated with obesity. Insulin helps to regulate excess fat accumulation by lowering the blood-sugar level (glucose) and adjusting metabolism (Strauss & Knight, 1999). In cases of obesity, it

is common for insulin resistance to occur, which results in excess insulin being produced by the pancreas. This constant stress on the pancreas and the imbalance of insulin and glucose can eventuate in death Leptin also has a role in weight regulation, energy expenditure and appetite. This protein, produced in the fat cells, acts by increasing energy expenditure and decreasing food intake, thus creating a negative energy balance (Krechowec, Vickers, Gertler, & Breier, 2006). Deficiencies in this protein have been found in many cases of obesity (Farooqi & O'Rahilly, 2000; Montague et al., 1997; Krechowec et al, 2006).

Without a doubt, genetic factors have a substantial effect on an individual's predisposition to overweight and obesity. However, rapidly rising prevalence rates among relatively stable genetic populations indicate extrinsic factors must also play a significant role in the development of childhood obesity (Farooqi & O'Rahilly, 2000). Thus, researchers have looked at additional potential risk factors. It is currently accepted that developing obesity is determined by both genetic and environmental factors; therefore whether a child becomes obese depends on their genetic susceptibility and the presence of environmental fattening stimuli, including low social class, single parent families, single child families, excessive television viewing, inadequate nutrition and inactivity (Poskitt, 1993).

Parental health. It is not surprising that parental health and BMI should influence their offspring's health, and more specifically, their weight. Pre- and perinatal factors including maternal smoking, parental adiposity and famine have been implicated as risk factors for childhood obesity (Owen, Martin, Whincup, Smith & Cook, 2005; Reilly et al., 2005). Observational studies have shown a direct relationship between maternal

obesity, offspring birth-weight and later obesity of the offspring (Ebbeling, Pawlak & Ludwig, 2002). The positive association between both paternal and maternal BMI and childhood obesity may be due to a combination of genetic links and the child's immediate environment (O'Callaghan, Williams, Anderson, Bor & Najman, 1997; Owen et al., 2005; Stettler et al., 2002; Strauss & Knight, 1999). Further, parental adiposity is positively correlated with child preferences for high-fat foods and their intake of fat (Fisher & Birch, 1995; Strauss & Knight, 1999). Another hypothesis for the relationship between parental and offspring weight, is that maternal obesity promotes an increase transfer of nutrients over the placenta, inducing permanent changes in appetite, endocrine functioning and metabolism (Ebbling et al., 2002).

Critical periods of Development. Although the alteration of nutrition at critical periods of development has not been examined in great detail, research does indicate that there are certain prenatal periods when altered nutrition can lead to increased risk of obesity (Dietz, 1994). In 1944, the German occupation, where there was severe food rationing, allowed researchers to observe the effects of reduced nutrition on babies who were prenatal during this time. Longitudinal research showed the prevalence of obesity increased among the men and women who were exposed to malnutrition during the first two trimesters of pregnancy, whereas those exposed in the third trimester showed the lowest rates of obesity (Ravelli, Stein & Susser, 1976).

Possible hypotheses as to why these periods have such an effect have been suggested. Krechowec and colleagues (2006) looked into critical periods and obesity development in rats and found that prenatal malnutrition led to changes in the regulation of the insulin-leptin axes. This change appeared to predispose offspring to diet-induced obesity. Ravelli

and colleagues (1976) suggested that appetite regulation and adipocyte numbers are entrained during the prenatal period. They suggested that either over or under nutrition may affect the differentiation of hypothalamic centres, which are responsible for the regulation of food intake.

Family Environment. In addition to the biological factors identified as contributing to the development of obesity, environmental factors also play a part. The family environment plays a crucial role in the development of positive or negative eating habits and parenting styles have been seen to influence factors including food preferences and the ability of the child to regulate uptake (Birch, 1999; Birch, Gunder, Grimm-Thomas & Laing, 1998; Foote & Marriott, 2002; Sullivan & Birch, 1994). Families also serve as role models, who reinforce and support the acquisition of eating and exercise behaviour (Epstein, 1996).

The ecological theory of development posits that some of the risk factors, which directly touch the child, such as caloric intake, are associated with other aspects of the family, which indirectly affect child health (Gable & Lutz, 2000). Several familial factors including low annual household income (Gable & Lutz, 2000; O'Callaghan et al., 1997; Strauss & Knight, 1999), low level of parental education, being in a single parent home (Gable & Lutz, 2000; Strauss and Knight, 1999), and low levels of cognitive stimulation at home (Strauss & Knight, 1999) have all been associated with poor early nutrition and an increased risk of childhood obesity.

Early Nutrition. Nutrition during infancy has been shown to affect childhood obesity via several pathways. Several studies have shown breast milk, as opposed to formula, offers

modest protection against obesity later in life (Bergmann et al., 2003; Lederman et al,. 2003; Owen et al., 2005; Stettler, 2007). Various factors have been proposed as links for this association, including the relative timing of the introduction of solids, which is often earlier in formula-fed infants (Ong, Emmett, Noble, Ness & Dunger, 2006; von Kries et al., 2002;), the rapid growth rate of formula-fed infants during the first year (Kramer et al., 2004), and the fact that formula does not contain the insulin and leptin present in breast milk, both of which are involved with weight regulation (Farooqi & O'Rahilly, 2000). Breast milk also helps to regulate protein and insulin secretion and modulates fat disposition and adipocyte development (Owen et al., 2005).

Following this, how well a child transitions to solids and continues to establish a varied diet, can have major effects on future eating patterns, food choice and subsequently the development of obesity (Birch & Fisher, 1997; Carruth, Ziegler, Gordon & Barr, 2004; Schwartz & Puhl, 2003).

Sleep .The increase of childhood obesity is a serious problem we are facing nationally and globally. It can lead to devastating health problems as well as social and psychological issues. Many factors, both biological and environmental, have been identified as potential risks for the development of obesity, including early feeding and nutrition. Recent research has also identified short sleep duration as a possible risk factor for childhood obesity (Agras et al, 2004; Knutson et al, 2007; Mamun et al, 2007; Reilly et al, 2005; Taheri, 2006; von Kries et al, 2002). The following section will present this finding.

Possible links between Sleep and later Obesity

As the prevalence of obesity has steadily risen, sleep patterns of infants, children and adults have also altered significantly. In particular the amount of sleep has markedly decreased. Several cross-sectional and longitudinal studies have looked at these two phenomena and have found interesting links (Agras et al, 2004; Knutson et al, 2007; Mamun et al, 2007; Reilly et al, 2005; Taheri, 2006; von Kries et al, 2002). Von Kries and colleagues (2002) identified that sleep duration has a clear effect on the percentage of body fat in five and six-year-old children. The study found that 15.6% of children sleeping for 10 hours or less a day had a high amount of body fat, defined as having a fat mass above the 90th age and gender-specific percentile, compared with 7.0% of children sleeping for 11.5 hours or more. Mamun (2007) completed a prospective study and found that young adults who had frequent sleeping problems during early childhood (ages 2-4 years) were 1.90 times more likely to be obese by 21 years than those who did not experience such problems. Further, the Avon Longitudinal Study of Parents and Children completed in the 1990's in the UK identified that short sleep duration at 30 months predicts obesity at age 7 (Taheri, 2006).

Several possible dynamics have been proposed to explain this link between short sleep duration and childhood obesity (Figure 6). Primary pathways include metabolic changes involving specific hormones and peptides such as insulin, glucose, ghrelin and leptin. In addition, increased exposure to food due to more hours spent awake and reduced physical activity due to daytime fatigue have also been proposed as possible factors linking reduced sleep and rising obesity rates.

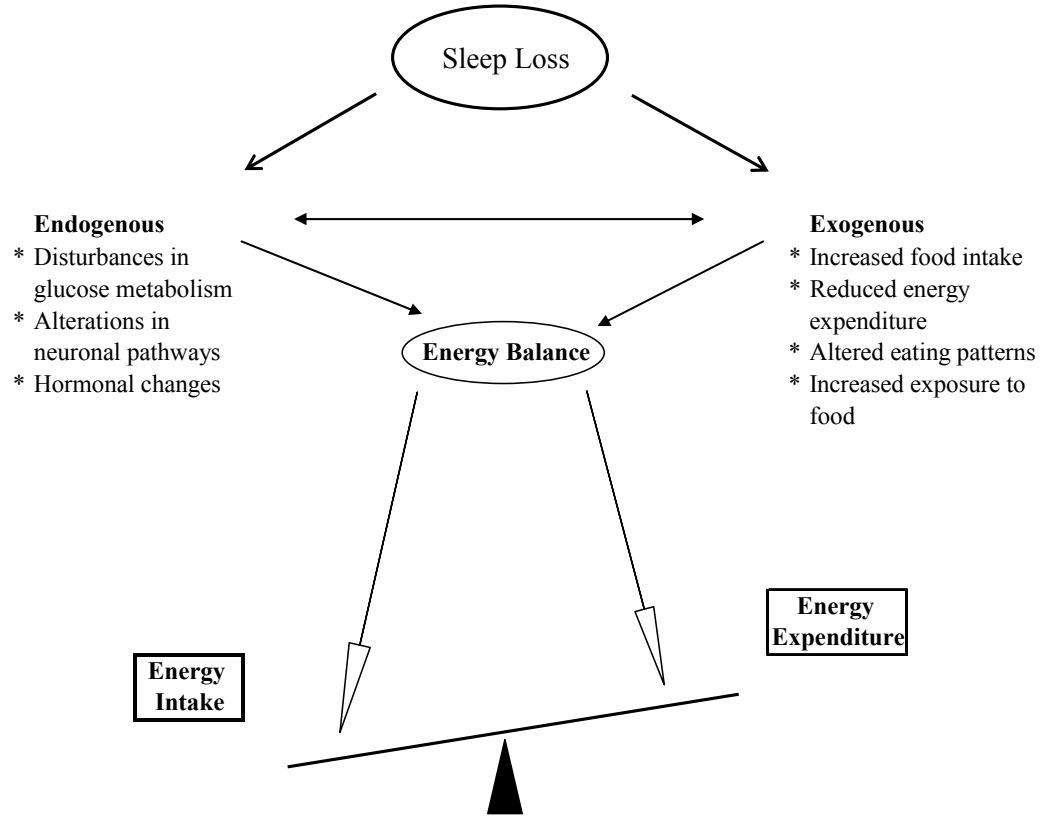

Figure 6. Positive energy balance due to reduced sleep, resulting in weight gain. Adapted from Knuston, Spiegel, Penev & Cauter, 2007.

Metabolic changes

Metabolic and hormonal changes that may lead to obesity have been seen as a result of sleep deprivation (Horne, 2008; Knutson et al, 2007; Mamun et al, 2007; Taheri, 2006; Reilly et al., 2005; von Kries et al, 2002). It has been proposed that obesity may arise due to sleep-loss induced energy-balance impairments linked to insulin-resistance/glucose tolerance and changes in leptin and ghrelin levels, affecting hunger and satiety (Horne, 2008; Knutson et al, 2007; Mamun et al, 2007; Reilly et al., 2005; Taheri, 2006; von Kries, Toschke, Wurmser, Sauerwald & Koletzko, 2002). These changes can lead to the increased risk of overweight and obesity as well as type II diabetes and metabolic

syndrome (Horne, 2008; Knutson et al, 2007; Taheri, 2006). Taheri (2006) goes further to suggest that sleep loss at a young age may alter the hypothalamic mechanisms that regulate appetite and energy expenditure.

Glucose Metabolism. Sleep loss has been seen to reduce glucose tolerance, which is a measure of how quickly exogenous glucose is metabolised and blood-glucose levels are returned to normo-glycemia (Knuston et al., 2007). Such changes in glucose metabolism are significant precursors for insulin resistance, which can lead to obesity and type II diabetes.

Hormonal appetite regulation. Short sleep duration also prominently affects two hormones, leptin and ghrelin, which have crucial and opposing affects in the regulation of hunger and satiety (Figure 7) (Knutson et al, 2007). Leptin is an adipose derived hormone acting at specific receptors in the hypothalamus. High levels induce satiation, reduce food intake and increase energy expenditure. It is critically involved in energy balance, glucose regulation, metabolic status and weight control. Ghrelin largely opposes the actions of leptin and is released primarily from the stomach lining with the role of stimulating appetite and food intake. Its levels increase before meals and decrease following food intake (Horne, 2008; Knutson et al, 2007). Short sleep duration leads to an increase in ghrelin and a decrease in leptin, which in turn leads to changes in appetite. Specifically, feelings of hunger increase and feelings of satiety are reduced, leading to increased food intake (Horne, 2008; Knutson et al, 2007; Taheri, 2006).

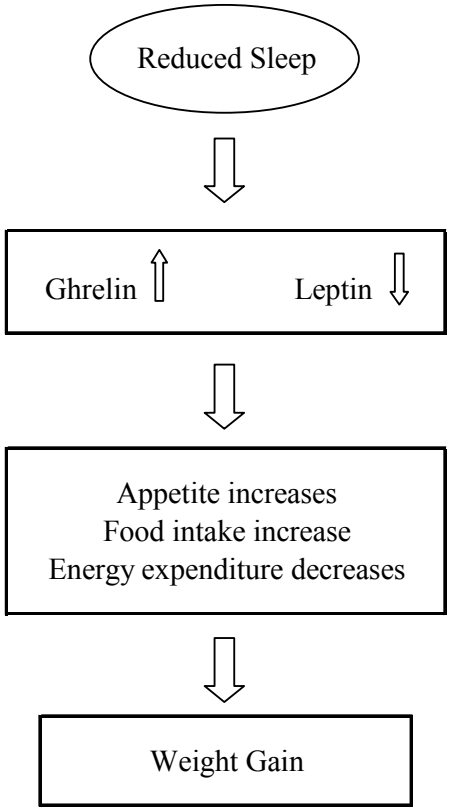

Figure 7. Effects of reduced sleep on Ghrelin and Leptin and their subsequent effects on weight.

Leptin, ghrelin and glucose also affect orexinergic activity. Orexinergic neurons project directly to all major wake-promoting centres as well as to appetite-stimulating neurons, thus providing a molecular basis for the connection between sleeping and feeding (Knuston et al., 2007). Recent research carried out by Harris, Wimmer and Aston-Jones (2005), have shown that orexins play a role in the motivation and reward system, which raises the possibility that short sleep duration may lead to increased food intake not related to caloric need. Consistent with this, an association has been shown between short sleep duration and irregular eating patterns (Imaki, Hatanaka, Ogawa, Yoshida & Tanada, 2002; Ohida et al., 2001, Knuston et al., 2007).

Sleep loss and Energy Expenditure. In order to maintain a healthy BMI and to reduce the risk of becoming overweight, adequate energy expenditure is essential. Studies have shown that people with reduced sleep report a significant reduction in their energy levels, and subsequently their physical activity (Knutson et al, 2007; Mamun et al, 2007; Taheri, 2006; von Kries et al, 2002). Several researchers have also noted the vicious cycle of decreased sleep and decreased physical activity (Figure 8). Sleep deprivation has been shown to lead to reduced activity during the day and equally, low levels of physical activity may result in restless, low quality sleep (Mamun et al, 2007; Taheri, 2006). The evidence shows that less physical activity, possibly due to daytime tiredness, can create a positive energy balance leading to weight gain (Knutson et al, 2007; Mamun et al, 2007; Taheri, 2006; von Kries et al, 2002).

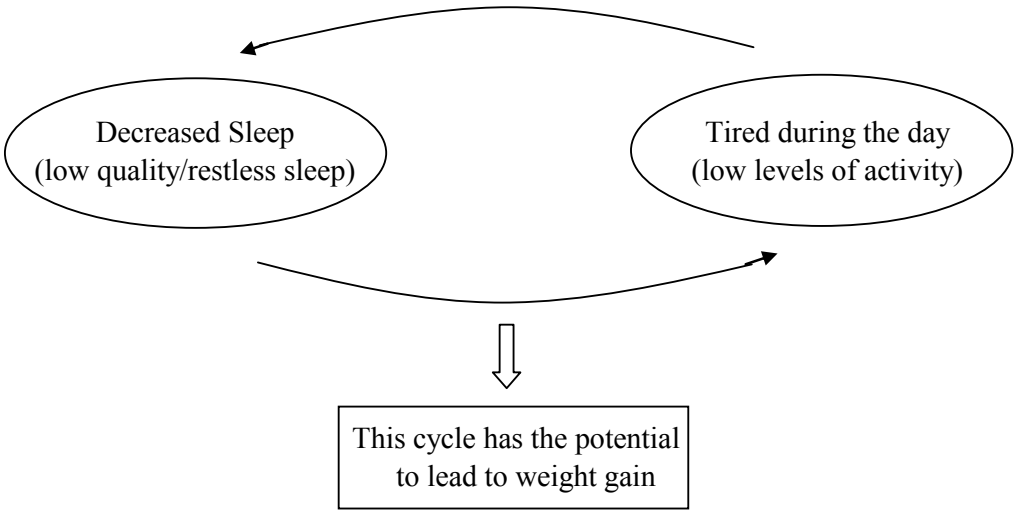

Figure 8. Cycle of decreased sleep and decreased physical activity.

Increased exposure to food. Researchers have also proposed that reduced hours spent asleep increase the exposure of the infant to environmental promoters of weight gain, such as night-time feedings, and thus may provide another link between sleep and

obesity (Knuston et al., 2007; Mamun et al., 2007; Reilly et al., 2005; Taheri, 2006; von Kries et al., 2002). In many studies, mothers have reported giving their baby additional milk, formula or even more carbohydrate-rich drinks including cereals, in an attempt to settle or re-settle their child before bed or during the night. This method of initiating sleep may add substantial calories to the baby's diet as well as having adverse effects on the child's sleeping habits (Mamun et al., 2007).

Opposition to the Link

A review completed by Horne (2008) has placed doubt on the strength of the association between sleep deprivation and obesity. He has indicated that although the research has indentified a link between the two, for the majority, reduced sleep does not lead to obesity. However, although the link may not be true for all, the fact that short sleep duration can potentially increase the risk for childhood obesity makes it an important feature to consider. As with any illness or disease, not every possible risk factor is seen in every case, this does not however suggest that some potential risks should be dismissed. Although the strength of the contribution of short sleep duration may not yet be fully understood, it is none-the-less worth investigating.

There is substantial research indicating a relationship between short sleep duration and obesity. Metabolic and hormonal changes, leading to altered appetite regulation have been seen in cases of sleep deprivation and lead to increased food intake and subsequent weight gain. Possible environmental links include reduced physical activity due to daytime fatigue, and increased exposure to promoters of weight gain, such as night-time feedings. The research investigating childhood obesity and short sleep deprivation is

relatively new and somewhat controversial, yet extremely important in the current climate of concern about the rising prevalence rates of obesity.

Rationale for the Current Study

Childhood obesity is on the rise in New Zealand and worldwide. Many potential risk factors have been identified, both biological and environmental. Early nutrition and sleeping are two factors, which have been proposed as possible links to childhood obesity and as such this study aims to identify whether problems in these two areas are in fact related.

This review has described a possible role of escape conditioning in both feeding and sleeping problems. Parents will attend intensively to their children with sleep problems during the night and similarly will provide preferred food options to fussy eaters. In both situations, the parents are allowing their child to escape the aversive situation of falling asleep alone or trying unfamiliar foods. In turn the parent avoids the child's resistance and distress, an aversive situation for the parent.

This study aims to address the relationship between sleeping and feeding problems in young children by asking, firstly whether feeding and sleeping problems co-occur and secondly, whether parenting is a common factor between problematic feeding and problematic sleeping.

The specific questions addressed in this study are whether problematic sleeping and feeding co-occur in infants, what common strategies are used by parents in relation to

feeding and sleeping and whether these strategies differ with regards to the presence of problematic behaviour in these areas. Further, the study will look at the beliefs parents hold about approaches to feeding and sleeping. In addition, whether general problematic behaviour is related to feeding and sleeping will also be addressed.

CHAPTER 3. METHOD

Participants

Twenty-four caregivers and their children aged 19 – 45 months took part in this study. Nineteen complete sets of questionnaires and diaries were returned to the researcher.

Caregivers responding to recruitment notices asking caregivers to make contact if they considered their children to have i) current feeding problems (N=0); ii) current sleeping problems (N=0); iii) both sleeping and feeding problems; or iii) no feeding or sleeping problems (N=19). In addition children needed to be between 18 and 48 months of age and to have no known medical conditions that may affect the child's ability to eat and sleep. All of the children in the study were eating solids, were able to self-feed and were all able to sleep unmonitored.

Participants were recruited by methods approved by the University of Canterbury Ethics Committee. Several methods of recruitment (Appendix B) were conducted including mail drops, and posting notices in public places including libraries, supermarkets and the hospital notice board. Child care centres were approached and were provided with notices to place in the centres. In addition, two of the centres included a recruitment notice in their electronic news letters, which is circulated to all parents. Notices were also placed in a free local news paper. In addition word of mouth was a valuable recruitment method, with participants passing on information to friends.

No caregivers reported their children as having sleep or feeding problems. Consequently, the presence or absence of sleep and feeding problems was determined from the direct measures described below.

This study was a cross sectional design incorporating both quantitative data from the validated measures and descriptive data from the diaries and the interviews.

Measures

Sleep Diary (Appendix D)

The sleep diary used was adapted from Richman's Sleep Diary (France, 1989). It consisted of an A4 sheet that allowed for seven nights of recording, beginning with actual bed-time and ending with time up in the morning. The diary also included a section for parents to record their responses to the child if and when the child calls out during the night. The diary was completed each morning for seven consecutive days, for the previous night's events. Parents were provided with an example of a completed diary and instructions on how to complete it.

This diary was used to establish the patterns of behaviour of the child and the parent at bedtime and during the night. Data was taken from these to identify common strategies parents were using to encourage their children to sleep.

Feeding Diary (Appendix E)

The feeding diary permitted parents to keep a daily record of their child's food intake and mealtime behaviours. This diary was to be completed each day, ideally after each meal. The diary provided an overview of what food was presented to and eaten by the child, the child's behaviour during the meal, how the parents responded to their child during this time, reasons for food choice, and the parent's satisfaction with the mealtime as a whole.

This diary provided information on the strategies parents were using during mealtimes to encourage their child to eat and common strategies were identified from the sample. In addition, the nutritional value of what the child was consuming was able to be established. This may reflect the child's behaviours for example; a very fussy child may eat only a small variety of foods.

Eyberg Child Behaviour Inventory (ECBI) (Eyberg & Ross, 1978)

(Appendix G)

This measure was used to identify whether children with problematic sleeping and/or feeding also had general problematic behaviours. The Eyberg inventory is appropriate for children aged 2-16 years. It assessed the frequency and severity of disruptive behaviours in the home as well as the extent to which parents find the behaviours problematic. 36 items were answered by the parent on a 5-point Likert scale, ranging from (1) this behaviour never happens to (5) this behaviour always happens A score above 130 indicates that the child has general problematic behaviour. In addition, the parent indicated whether they consider the behaviours to be problematic, by circling either 'yes' or 'no'. Two scores were formulated from this inventory; an Intensity score

was calculated by summing the item ratings from the Likert scale and the number of indicated 'problem' behaviours created the Problem score.

Parenting Sense of Competence Scale (PSOC) – (Johnston & Mash, 1989)

(Appendix G)

This measure would identify the parents who did not feel competent in their parenting role. The study wanted to identify whether parents who did not feel as competent were those with children who displayed problems with either feeding and/or sleeping. The PSoC scale was completed by the parent and measured their satisfaction and efficacy in their parenting role. 16 items were answered on a 6-point Likert scale ranging from strongly agree (1) to strongly disagree (6). A high score reflects a high sense of competence. The questionnaire is divided into two subscales; the Satisfaction scale, consisting of nine items, and the Efficacy scale, consisting of seven items. The satisfaction scale reflects parenting frustration, anxiety and motivation, while the efficacy scale assessed capability, problem-solving ability and competence (Rogers & Matthews, 2004).

Maternal Cognitions of Infant Sleep Questionnaire (MCISQ) (Morrell, 1999).

(Appendix G)

This measure provided information about the beliefs parents held with regards to infant sleep as well as information on parent sleep management strategies. This would help to build a picture of why they may have chosen certain strategies to encourage sleep. Parents completed the MCISQ, consisting of 27 items on a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree. A lower score on this scale reflects parent cognitions that their child is ok to sleep alone and that their child will not be

negatively affected physically or emotionally if they are not responded to immediately every time they call out. A higher score may reflect parent cognitions that

Child Feeding Questionnaire (CFQ) (Johnson & Birch, 1994).

(Appendix G)

Parents completed the CFQ, which assessed parental beliefs, attitudes, and practices regarding child feeding. It includes five factors; concern about child weight, restriction of 'unhealthy' foods, pressure to eat, parental responsibility for the child's eating and parental monitoring of the child's eating. The questionnaire includes 15 questions, which were answered on a 5-point Likert scale.

The Parental Authority Questionnaire (PAQ) (Baumrind, 1966).

(Appendix G)

Parents completed the PAQ, which is designed to measure Baumrind's three parenting typologies; permissive, authoritarian and authoritative. It was possible that children with feeding and sleeping problems may have parents who were more likely to score as permissive. The scale includes 30 items (10 items to assess each typology) that were answered on a 5-point Likert scale.

Procedure

Potential participants contacted the researcher via email or phone, at which point they were sent the information sheet (Appendix C). This sheet covered the inclusion criteria for the study and outlined what their role as a participant would be if they chose to take part. It also explained the voluntary and confidential nature of participation.

Following agreement to take part, the researcher made contact via telephone. During the conversation with prospective participants, eligibility was established and the voluntary and confidential nature of the study reiterated. Meeting times were then arranged and the potential participant was informed that they would receive a consent form (Appendix C) in the mail, which needed to be completed before data collection was able to begin.

During the face-to-face meeting, the signed consent form was sighted and any questions from the participants regarding the study were addressed. Following this, the questionnaires and diaries were presented and the general purpose of each was explained. Participants were also shown how to complete each of the forms. The researcher then proceeded with the semi-structured interview (Appendix F). Approximately six questions were asked with additional prompts to gather further details. During this time, the participant was welcome to ask any questions.

On completion of the interview, participants were given further opportunity to raise any questions and they were given the opportunity to read over the interview notes the researcher had taken. The researcher left the participants with the five questionnaires and two diaries to be completed, along with a pre-paid envelope to return the completed forms.

CHAPTER 4. Results

The analysis is divided into four sections. The first section describes the characteristics of the children in the study. The second section presents data obtained from the five questionnaires, and the sleep and feeding diaries. In the third section predictive relationships are investigated via simultaneous multiple regression models. The final section presents the common parenting strategies used during mealtimes and around sleeping derived from the interviews and diaries.

Section One: Characteristics of the Children

Included in the study were 19 complete data sets, including 11 boys and eight girls. The mean age of the children was 36 months (median 40 months) with a range from 19 months to 45 months. Table 2 displays the gender and age of each child at the time of the interview.

Table 2

Child Characteristics at Initial Interview

Child (female)	Age (months)	Child (male)	Age (months)
1	43	4	19
2	41	5	40
3	45	7	42
6	22	8	32
10	31	9	32
13	41	11	44
15	42	12	43
17	40	14	24
		16	42
		18	26
		19	31
mean	38.13		34.10
SD	7.72		8.67
mean (total)			36
SD (total)			8.31

N = 19

Section Two: Questionnaire, Interview and Diary Data

Table 3 presents the raw data from the five questionnaires for each family. Table 4 presents the Parent Sense of Competence Questionnaire (PSoC) scores for the sub-groups separately, namely Satisfaction and Efficacy.

Table 3
Individual Scores for the Questionnaires

Child	Eyberg	PSoC	MCISQ	PAQ	CFQ
Female					
1	89	74	43	1	17.92
2	76	84	52	1	16.41
3	71	97	65	1	18.03
6	60	78	38	1	15.45
10	90	76	44	1	17.33
13	74	86	43	1	17.91
15	88	57	54	1	15.25
17	82	74	63	1	14.42
Mean (female)	78.75	78.25	50.25		16.59
SD (female)	10.48	11.57	9.94		1.41
Male					
4	90	62	49	2	16.09
5	112	77	52	1	21.09
7	73	38	45	1	16.00
8	84	70	65	1	18.00
9	66	56	46	2	18.33
11	75	78	39	1	14.00
12	130	59	54	2	16.00
14	57	97	65	1	18.03
16	93	94	40	1	15.67
18	89	76	42	1	16.25
19	80	74	50	1	18.75
Mean (male)	86.27	71.00	49.73		17.11
SD (male)	20.63	16.92	8.92		1.94
Mean (total)	83.11	74.05	49.95		16.89
SD (total)	17.14	14.99	9.10		1.71

N = 19

Eyberg = The Eyberg Behavioural Inventory (problem score)

PSoC = Parenting Sense of Competence Questionnaire (total)

MCISQ = Maternal Cognitions on Infant Sleep Questionnaire (total)

PAQ = Parental Authority Questionnaire (1 = Authoritative, 2 = Authoritarian, 3 = Permissive)

CFQ = Child Feeding Questionnaire (partial)

Table 4
Parental Sense of Competence Subgroup Scores

	Satisfaction		Efficacy	
	Female	Male	Female	Male
Mean	41.63	39.55	36.63	36.73
SD	4.6	9.5	9.78	6.36
Mean (total)	40.42	36.68		
SD (total)	7.71	7.72		

N = 19

No scores in the sample exceed the problem cut-off score of 130 in the Eyberg. The mean and SD in the sample were both smaller than those calculated by Eyberg and Ross (1978) when they completed a validation of the measure (mean = 104.34, SD = 24.50). The sample mean for the Maternal Cognitions on Infant Sleep Questionnaire was larger than the mean obtained by Morrell (1999) when he completed an analysis of the measure (29.18). The SD in the sample however was slightly smaller than that calculated by Morrell (1999) (13.64). Mean scores from a normative sample for the Parenting Sense of Competence Questionnaire for satisfaction and efficacy were 38.09 and 25.27 respectively (Thompson et al, 1996). The satisfaction score for the present sample was within one SD of this normative sample and the efficacy score was higher than the normative value, within two SDs. The results from the Parent Authority Questionnaire indicate that all but three of the parents who completed the questionnaires, could be described as Authoritative. The other three parents fell into the Permissive group. There were no significant gender differences in any of the questionnaires. Table 5 shows the correlation matrix using Pearson's product-moment correlation (r) for four of the five

questionnaires. The Parental Authority Questionnaire was not included as the data is categorical. Further all but three parents were in the same category. Pearson's r did not differ significantly from zero in any of these correlations.

Table 5

Correlation Matrix

	CFQ	Eyberg	MCISQ	PSoC
CFQ	1	0.093	0.231	0.179
Eyberg	0.71	1	-0.004	-0.232
MCISQ	0.34	0.99	1	0.158
PSoC	0.46	0.34	0.52	1

$p \leq 0.01$, N = 19

Note. The figures above the diagonal midway line represent the Pearson's product-moment correlation. The data below this line represents the level of significance.

Eyberg = The Eyberg Behavioural Inventory (problem score)

PSoC = Parenting Sense of Competence Questionnaire (total)

MCISQ = Maternal Cognitions on Infant Sleep Questionnaire (total)

CFQ = Child Feeding Questionnaire (partial)

As general problematic behaviour increased (indicated by the Eyberg), the parent's sense of competence decreased. Also, as the child feeding scores increased, so did the maternal cognitions of infant sleep score, but neither of these scores reached significance.

Table 6 presents the number of servings each child consumed from the five food groups over the course of the week. The nutritional intake column presents an overall view of the range of food the children are consuming.

Table 6

Nutritional Intake Data

Child	Fruit ≥ 14[a]	Vegetables ≥14	Breads and Cereals ≥ 28	Milk 10 to 11	Meat/Poultry/ Legumes 3 to 7	Nutritional intake (X/5)
1	9	4	23	14	7	2
2	7	7	14	9	15	1
3	10	2	25	8	10	3
4	18	9	28	22	2	2
5	12	8	29	14	2	2
6	15	2	19	18	4	3
7	10	6	19	10	14	2
8	14	7	28	14	4	4
9	6	4	21	11	18	2
10	23	9	30	15	7	4
11	19	10	28	26	10	4
12	17	8	28	19	2	3
13	19	7	29	16	7	4
14	12	4	28	14	15	3
15	14	7	24	17	11	3
16	18	2	19	15	4	3
17	16	11	18	21	7	3
18	10	3	18	11	8	2
19	14	8	21	18	10	3
Mean	13.84	6.21	23.63	15.37	8.26	
Stdev.	4.54	2.82	4.89	4.65	4.79	

Note. The number given to each child for Nutritional Intake reflects whether they reached the recommended intake for each of the five food groups. The scores range from (0) met the recommended intake for no group, to (5) met the recommended intake for all five groups.

N = 19

a = Recommended weekly serving intake for a child aged 24-48 months

The recommended serving intakes noted in Table 6 were obtained from the Auckland Regional Public Health Service guidelines for pre-school children (Neumegen, 2008). The mean intakes for the sample reached the recommended guidelines for only two groups; Milk and Meat/Poultry/Legumes. Fruit and Cereal mean intakes were within one standard deviation of the recommended weekly intakes, with ten and eight children

reaching and/or exceeding the recommended intakes for fruit and cereal respectively. The mean intake for the vegetable group was within 3 standard deviations below the recommended amount, with no children reaching the minimum recommended quantity.

Four, five, seven and three children met the recommended intake/s for one, two, three and four out of the five groups respectively. No child met the recommended intake for all five groups.

Table 7
Sleep Characteristics

Child	DB	PPRO	PPRA
Female			
1	+	+	+
2	-	+	-
3	+	+	+
6	-	-	+
10	+	-	+
13	+	-	-
15	+	-	-
17	-	+	+
%	62.5	50.0	62.5
Male			
4	-	-	+
5	+	+	+
7	-	-	+
8	-	-	+
9	-	-	+
11	+	-	+
12	-	-	+
14	+	+	+
16	-	+	+
18	+	-	+
19	+	-	+
%	45.5	27.2	81.8
% Yes	52.6	36.8	73.6

N = 19

DB = Delayed bedtime (taking ≥ 20mins from bed to silence)

PPRO = Parental presence required at sleep onset

PPRA = Parental presence required following an awakening during the night

+ Yes, - No

Table 7 shows the sleep characteristics of the 19 children, obtained from the sleep diaries and the interviews. Delayed bedtime was experienced by 10 children and seven required a parent to be present when they were initially placed in bed and did not fall asleep alone. Further, 14 children did not re-initiate sleep without parental presence following awakening during the night. No significant gender differences were observed.

Table 8 presents the mealtime characteristics including behavioural disturbance and parent satisfaction with the eating as reported by parents. The nutritional intake data is taken from the feeding diaries.

Table 8
Mealtime Characteristics

Child	Nutritional intake	Behavioural disturbance	Parent satisfaction
Female			
1	2	+	-
2	1	-	+
3	2	-	+
6	3	-	-
10	4	-	+
13	4	-	+
15	3	+	-
17	3	-	-
Mean	2		
% Yes		25	50
Male			
4	2	-	+
5	2	+	-
7	2	-	-
8	4	-	+
9	2	-	+
11	4	-	+
12	3	-	+
14	3	-	+
16	3	+	-
18	2	-	-
19	3	-	+
Mean	2		
% Yes		18	64
Mean (total)	2		
% Yes (total)		21	58

N = 19

NI = Nutritional intake (see Table 3 note.)

BD = Behavioural disturbance during mealtimes as reported by parent/s.

PS = Parental satisfaction with feeding behaviours.

+ = Yes, - = No

Four children displayed behaviours during mealtimes, which parents deemed to be problematic. Eight parents reported not being completely satisfied with their child's overall eating, including nutritional intake and child behaviour during meals. There were no significant gender differences.

Concordance of Feeding and Sleeping Problems

Composite Feeding and Sleeping scores, ranging from 1-4 representing the number of 'problems' as reported by parents (Tables 5 and 6), were calculated as follows.

Individual Feeding and Sleeping Scores:

1 = No problems

2 = 1 problem

3 = 2 problems

4 = 3 problems

Combined Scores:

2 = no problems

3 = one problem

4 = two problems

5 = three problems

6 = four problems

7 = five problems

8 = six problems

For example, a child displaying two problematic sleeping behaviours and one problematic feeding behaviour would receive scores of three and two respectively, giving them a total score of five.

Adding these together gave a combined score (Table 9) ranging from two, indicating no problems in either domain, to 8, indicating three problems in each domain. The sleeping score is based on delayed bedtime, and the requirement of parental presence at bedtime and following a night awakening. The feeding score is based on nutritional intake, behavioural disturbance, and parental satisfaction. These scores (Table 9) were used in the Multiple Regression Analyses. Children had an average problem score of between two and three, which indicated an average of one to two problems in each of the two areas.

Table 9

Concordance Score (Sleep and Feeding scores)

Child	Sleep score	Feeding score	Combined score
Female			
1	4	4	8
2	2	2	4
3	4	2	6
6	2	3	5
10	3	1	4
13	2	1	3
15	2	3	5
17	3	2	5
Mean	2.75	2.25	5.00
Male			
4	2	1	3
5	4	4	8
7	2	3	5
8	2	1	3
9	1	2	3
11	3	1	4
12	1	1	2
14	4	1	5
16	3	4	7
18	3	3	6
19	3	1	4
Mean	2.55	2.00	4.55
Mean (total)	2.63	2.11	4.74

N = 19

The scores show a normal distribution although slightly skewed to the left, indicating that in the sample it was more common for the children to display a smaller number of

problems. The sleeping and feeding composite scores were not significantly correlated ($r = 0.33$, $n = 19$, $p = 0.16$) and there were no significant gender differences.

Section Three: Predictive Relationships

The following analyses were completed in an attempt to identify whether the sleep and feeding composite scores were able to be predicted by certain independent variables. In addition, the feeding and sleeping scores were regressed against each other to determine whether it would be possible to predict one score from the other. Two simultaneous multiple regression analyses were completed.

Table 10 presents the correlations between the four questionnaires and the two diaries. The Parental Authority Questionnaire is not included as the data is categorical.

Table 10

Correlation Matrix

	Sleep	Feeding	CFQ	Eyberg	MCISQ	PSoC
Sleep	1	0.331	0.324	-0.089	0.183	0.614**
Feeding	0.166	1	0.156	0.206	-0.220	-0.123
CFQ	0.176	0.523	1	0.093	0.231	0.179
Eyberg	0.717	0.412	0.710	1	-0.004	-0.232
MCISQ	0.453	0.365	0.340	0.989	1	0.158
PSoC	0.005	0.616	0.463	0.338	0.518	1

Note. The figures above the diagonal midway line represent the Pearson's correlation. The data below this line represents the p-value for level of significance. $p \leq 0.01$, $n = 19$.

Sleep = Sleep score

Feeding = Feeding score

CFQ = Child Feeding Questionnaire (partial)

Eyberg = The Eyberg Behavioural Inventory (problem score)

MCISQ = Maternal Cognitions on Infant Sleep Questionnaire (total)

PSoC = Parenting Sense of Competence Questionnaire (total)

One significant correlation was observed from the 10 completed, between the Sleep score and PSoC ($r = 0.614$, $n = 19$, $p = 0.005$). As the number of sleep problems increased, the parent's sense of competence also increased. In addition, as the number of sleep problems increased, general problematic behaviour decreased, as shown by the negative relationship between the Sleep score and the Eyberg. The Sleep score was positively related with the Feeding score, however, this relationship was not significant.

The Feeding score was not significantly correlated with any measure. As the number of feeding problems increased, general problematic behaviour also increased, and parent's sense of competence decreased.

Simultaneous Multiple Regressions

The following section presents the final data from a series of simultaneous regressions. The aim was to determine if any of the measures used in this study were able to predict problematic sleeping or feeding. Initially, correlations were looked at and it was established which measures were more highly correlated with the sleep and feeding scores. Due to the small sample number, the number of independent measures able to be entered into the multiple regressions was severely limited. As such, a series of multiple regressions, with the Sleep score and the Feeding score as dependent variables were completed. The final simultaneous multiple regressions are presented below. The measures in these two regressions were chosen for two reasons; firstly, the primary aim was to establish whether the Sleep score was able to predict the Feeding score and vice versa, whether the Feeding score was able to predict the Sleep score. Secondly, with the advice from a statistical consultant (Professor Garth Fletcher), a second variable was chosen for each regression analysis. These measures were chosen based on their initial correlations and predictive ability in the series of simultaneous multiple regressions.

Table 11

Summary of Simultaneous Multiple Regression of two Measures on Sleep

Variables	*B*	SE	*ß*	*t*	*p*	Part Correlation Coefficient	Part Correlation Coefficient (Squared)
Feeding score	0.374	0.154	0.413	2.432	0.166	0.410	0.168
PSoC	0.042	0.011	0.665	3.918	0.005*	0.660	0.436

$p \leq 0.01$
$R^2 = 0.546$
Adjusted $R^2 = 0.489$

The first regression model (Table 11), including the feeding score and PSoC, explained 49% of the variance in the sleep score ($p \leq 0.01$). Individually, the PSoC made a significant, unique contribution to the model ($ß = 0.665$, $p \leq 0.01$), and the feeding score made a smaller non-significant contribution ($ß = 0.413$, $p = 0.166$).

In the second regression model (Table 12), the sleep score and the MCISQ were entered as predictors of the feeding score. The model explained 9% of the variance in the feeding score ($p = 0.183$). Neither variable made a significant contribution, although the sleep score did make a greater contribution than the MCISQ score; ß(Sleep score) = 0.384, $p = 0.166$ and ß(MCISQ) = -0.291, $p = 0.365$.

Table 12

Summary of Simultaneous Multiple Regression of two Measures on Feeding

Variables	*B*	SE	*ß*	*t*	*p*	Part Correlation Coefficient	Part Correlation Coefficient (Squared)
Sleeping score	0.424	0.252	0.384	1.68	0.166	0.387	0.150
MCISQ	-0.034	0.027	-0.291	-1.271	0.365	-0.303	0.092

$p \leq 0.01$
$R^2 = 0.191$
Adjusted $R^2 = 0.090$

Section Four: Themes about Parenting Strategies from the Interviews and Diaries

Both the feeding and sleeping diaries were completed by the parents for seven consecutive days and were constructed in such a way as to determine what strategies parents used when certain behaviours were displayed by their children. The sleep diary gathered information about the quantity of sleep, when and where sleep was occurring and what strategies were used at bed-time and following night awakenings. The food diary gathered information on the type and quantity of food that was consumed, the behaviours of the child during the meal and what strategies were used by the parents.

Sleeping

In relation to sleeping, the study focused on strategies used at bed time and those used following night awakenings. Information on the structure of bedtime routines was also gathered.

All parents in the study reported being relatively happy with their child's sleeping habits. Although several parents stated that they would prefer the settling period to be shorter and for their child to be able to settle alone, all believed that these milestones would come with time and at this stage they were happy to continue as they were. Parents reported using various techniques around sleep initiation and re-initiation, with several common strategies emerging. These included parental presence until the child is asleep allowing co-sleeping, getting up to their child during the night; allowing their child to decide when they want to go to bed. Two less commonly used strategies included controlled crying and the removal of privileges for 'bad' behaviour. Breast feeding to sleep was used in several families with younger children.

The most common response from a parent for a child not settling alone at the beginning of the night was the same response used following a night awakening, namely, parental presence. Parents stated that they choose to stay with their child for several reasons, a) it minimises the length of time both parent and child are awake, b) it minimises/eliminates further behavioural outbursts at that time, for example crying, yelling and throwing of toys/blankets, and c) the belief that parents should not leave their child when they are calling out.

Two distinct processes were seen in relation to bedtime routines; the most common was the routine which was generally set but flexible due to the activities that occurred during the day, for example bedtime was usually 7.00pm, but dinner at Grandma's house may delay this until 8.00pm for that particular night. Another common routine is one that is largely child-directed. In families, which engaged in this strategy, the bedtimes were very flexible and were largely determined by the child. Parents stated that their child would generally go to bed within a one hour time frame, although they were happy for their child to stay up later if they were not ready for bed. They were allowed to engage in quiet activities such as reading or sitting with their parents until they were ready for bed.

The most common reasons for choosing to use such strategies around sleep re/initiation and routines include; maintaining a process of least resistance, gaining more sleep for the child and parents, the belief that the behaviours will decrease with age, and not wanting to create tension around sleep and bed-time.

Feeding

In relation to feeding, this study was primarily interested in strategies used for food refusal, fussiness, inappropriate behaviours during mealtimes, and ensuring appropriate nutritional intake.

Parents were generally happy with their children's eating habits. Many said they wished their child would eat more of a certain food group, most commonly vegetables, but were satisfied because they believed that this was generally compensated for by their child eating more than enough from other food groups, for example fruits.

When dealing with fussiness and food refusal, several common strategies were reported. Although only one family considered their child to be fussy, all families admitted that there were occasions when their child would refuse a meal. Several common strategies following food refusal were observed, including; encouragement to taste the food, engaging in a 'food game' for example 'Race Daddy to finish a mouthful', and offering of a second meal option. Two less common techniques included; not offering a second option and the use of a family plate. The family plate is a practice where children and parents eat from several communal plates. All parents were very keen to minimise food refusal before it had the chance to occur. Quite often parents reported that they would prepare food they knew their child would eat to reduce any food refusal. It was also common for parents to encourage their child to have input into the meal choice.

The most common response to food refusal was to initially encourage a taste of the food. Following this, several parents engaged in 'food games'. If these tactics did not work, many parents would offer their child another healthy option for dinner. A few families

had the rule that their children only have one option for dinner and if they do not eat it they will not be offered a substitute. In these families, the children usually had considerable input into what was being prepared for dinner and thus it was rarely refused. However, these parents tended to allow some food before bed, for example a banana and or a glass of milk if their child was hungry. Many families encouraged their child to take part in the meal choice process, often suggesting a couple of options for them to choose from. Parents felt that this helped minimise any refusal. Several common reasons emerged for this, including; not wanting their child to go hungry, not wanting to create tension around mealtimes, easier option for the parents (in comparison to dealing with a crying child), and the belief that it is more important for their child to eat healthily rather than to stick to rules.

One child showed obvious problematic feeding. He consumed a very limited diet and was not willing to try new foods. He did not eat the family dinner, but rather his mother made him a separate plate each night consisting of a very limited range of foods. Reasons for this strategy included not wanting "drama" at mealtimes and the belief that their child was getting all the nutrients he required. The parents also stated they would engage in a rewards system for eating family food when their child was a bit older, i.e., four to five years old. His age at the time of the interview was 42 months.

Nutritional Intake. From the interviews it was identified that the overall primary goal among the families, in relation to feeding, was to ensure adequate nutrition was being consumed while maintaining minimal tension during mealtimes. The food diaries indicated that the children were not receiving the recommended servings from the five

main food groups (Table 3) and further, many of the children were only receiving the recommended weekly intakes in one or two of the groups.

Several common strategies used to ensure consumption of a healthy diet emerged, including; allowing a second choice following food refusal, preparation of 'child friendly' healthy meals, hiding less preferred vegetables in the dinner, encouraging the child to eat from the family plate, encouragement to try each of the foods in the meal.

Reasons given for engaging in such practices included; maintaining a relaxed environment around eating, the belief that occasional refusal is not an issue, and that parents prefer their child to eat rather than maintain strict rules.

DISCUSSION

This study aimed to ascertain whether feeding and sleeping problems co-occur in infants and whether they are accompanied by similar parenting strategies. All the caregivers ultimately recruited in this study reported that their children had no sleeping or feeding problems, yet diary data indicated that half the children had more than one problem in one or both domains. In addition, many parents reported going to some lengths in order to settle their child or to encourage him or her to eat.

Three parents scored in the permissive range on the PAQ while the remainder scored in the authoritative range. So there was no clear relationship between sleeping and feeding behaviours and parenting style. Intensive strategies were used by a large number of parents and there was no evidence to suggest that parents of children with sleeping and feeding problems used different strategies from the other parents. The inconsistency in parental report presented some difficulty for the study so a summary score was derived and formed the basis for the statistical analyses. Sleeping and feeding scores did not correlate and there was no evidence, from this study, that sleeping and feeding problems co-occur.

Both feeding and sleeping are both partially learned behaviours, and as such parents would seemingly have a substantial role to play in the development of these behaviours. More specifically, certain strategies parents use may have the ability to lead to problematic behaviours. However, in this research no pattern was found between the problematic behaviours in either domain, and parent strategies. It may be the case that there are many other factors acting on the development of both sleeping and feeding, and

although parent strategies may influence this development to a degree, the other factors over-ride this contribution.

A very interesting feature in this study was the degree to which parents did not believe their children had problematic behaviours in either domain, however, the data clearly showed otherwise. In relation to feeding, over half the parents in this study were satisfied with their child's eating, even though no child reached the recommended serving intake for all five of the food groups, as presented in the Auckland Regional Public Health Service guidelines for pre-school children (Neumegen, 2008). This leaves almost half of the sample that was not satisfied with their child's eating, however, they did not believe their child displayed problematic behaviour in this area. Several of the children in this study ate from relatively limited menus and the data showed that none reached the recommended nutritional intake. How then did the parents not associate this with problematic behaviours? Many parents admitted to sometimes trying to introduce additional foods to the menu, however, they stated this was a waste of their time as the children would not eat it. It appears that parents engaged in numerous strategies to adapt to their child's behaviour, including provision of favourite meals and the offer of a second choice. To the parents there may not have been a problem, when in fact they may have been merely adjusting to cope with their child's behaviour and in essence ignored the problem.

It may have been the case that behaviours the children were displaying, would have been quite problematic had the parents not adjusted their strategies to suit. Several parents stated that if their child began refusing more frequently, they would have to use a different strategy. When questioned, parents had no strategy in mind and were unsure

how their child would adapt to such a change. As it was, the parents in this study tended to provide meals that they knew their child liked and many prepared a second option if the child decided they would like something different. This in itself can become a negative cycle as the child learns to refuse the first option to receive a more palatable meal. Parents did not see flat out refusal (the child would eat the second option), and "drama" did not occur because the child was given what he or she wanted. It seems that the parents were adapting to the demanding behaviours of their children in order to avoid overt problematic behaviours. In the literature such behaviours are seen in coercive cycles where both parties are trying to avoid a negative outcome.

With regards to sleeping, reports from parents clearly indicated problematic behaviours. Half the children took longer than 20 minutes to settle once placed in bed; over a third required parental presence to initiate sleep; and almost three quarters required parental presence following a night wakening, yet no parent felt their child had problematic behaviours in this area. As with feeding, the parents adopted a variety of strategies to adjust to their child's behaviours, including remaining with their child until the child fell asleep and tending to their child during the night if they woke. Not being able to self-soothe and the inability to re-initiate sleep during the night are considered problematic in the literature, however, in this sample, parents were happy to remain with their child and did not see these behaviours as problems.

Many of the parents believed the behaviours were age-appropriate and would phase out by themselves. They were happy to continue with their current practices and would change as their child grew. It was a common theme that parents did not want to continue with these practices for too much longer and would like their child to fall asleep alone

but none had strategies in mind as to how this would be achieved. While tending to their child's needs now, the parents may have been establishing some behavioural contingencies that will be very hard to break. It may be that when the parents attempt to eliminate these behaviours that the problems become more overt.

There may also be other reasons why the parents did not identify problems. They may find it difficult to admit to problems in order to protect their sense of competency; they may feel at a loss with regard to action to take; they may be concerned that the problems would get worse if they did take action. It may be that parents were genuinely happy to provide a second option for a meal and to remain with their children until they fell asleep as they saw this as a normal part of growing up.

Limitations to the Study

There are several limitations to this study, including the demographic composition of the sample, the small sample size, the small amount of variation among the participants, certain measurement characteristics, and the calculation of the final sleep and feeding scores.

The parents who volunteered to take part in this research were a fairly homogenous sample of middle-class, predominantly Caucasian parents. They appeared well-motivated and interested in information regarding the well-being of their children. All but one were in two-parent families. These factors may reduce the ability to generalise the results to families with lower socio-economic status, single-parent families, and families of different ethnicities. Further, several of the parents who participated belonged to groups who held similar beliefs about parenting, for example practicing co-sleeping and the use

of the “family plate”. These families may have had similar philosophies, which may also have created a bias in the results.

A second limitation was the small sample size. While recruitment attempts were extensive, it remained very difficult to enlist participants. 26 interviews were completed, however, only 19 complete data sets were completed and returned to the researcher. It is difficult to make sound conclusions based on this small sample. The small sample also heavily restricted the number of variables that were able to be entered into the simultaneous multiple regressions.

A third limitation is also related to the small sample size. There was very little variation between the children in terms of their level of problems with sleep and feeding. From parent reports the majority of children did not display problematic behaviour in either of these areas. Having children with a wider spectrum of problems in these two areas may have allowed for the children to be grouped according to their level of problems, and comparisons could have been made between the groups. A larger sample may have provided the variability required for comparisons to be made.

Fourthly, the food diary did not allow for information to be recorded indicating actual amounts of food consumed. The nutrient intake scores given to each child may be a reflection what was offered rather than their actual intake. It may have been beneficial to give parents a chart outlining serving sizes for the different food groups so they were able to more accurately describe how much was consumed.

Further, the measures chosen for this study may not have measured the concepts clearly and may not have been the most appropriate for this sample. For example, the Eyberg Inventory covers children from as young as two years and two children in this study were below this age. Parents also stated that some of the questions were not relevant due to their child's age. The Parental Authority Questionnaire was also too general for the set objective. It did not gather enough information about specific parenting practices related to this study. It may have been more beneficial to use a more specific scale such as the Parenting Scale or to carry out observations on each of the families.

A final limitation was the calculation of the Feeding and Sleeping scores. This system may not have represented of the level of problematic behaviour accurately due to the fact that only three criteria were included in each calculation. In addition, although the problems included in the scores were considered problematic according to the literature, the majority of parents in the sample did not regard them as a problem. It also seemed that the majority of parents in the sample had adjusted substantially to their children's behaviours and as such they did not see any problems with regards to feeding and sleeping. Having standardised, objective definitions of problems may have alleviated this.

Implications for Future Research

Research suggests that both early nutrition and short sleep duration in early life may increase the risk of developing obesity. Although it is essential to look at these areas in detail separately, it may also be beneficial to look at a possible link between the two as they can both be considered partially learned behaviours and partially physiological in origin. The possible common link of parenting should be investigated in greater detail, in

an attempt to identify possible patterns, which may be detrimental to both sleeping and feeding, and thus could in time increase the risk of obesity.

In order to carry out such a study, objective measures of parenting style and problematic sleeping and feeding would need to be employed. In addition, a larger sample consisting of both problematic and non-problematic sleepers and feeders should be used. It was very difficult to recruit participants with children displaying problematic behaviours in one or both areas. A possible solution to the small sample with little variation with regards to problematic behaviour, may be to offer parents an intervention. This may provide enough incentive to parents who do have children with problematic behaviours in these areas to participate.

A longitudinal study following children similar to those in this study would ascertain whether or not the behaviours evidenced in this study led to sleeping and feeding problems and obesity, down the track.

Conclusion

The aims of this study were two-fold; firstly, it investigated whether problematic sleeping and feeding co-occurs in young children, and secondly, whether the strategies parents engaged in differed depending on the problematic behaviour of the children.

Results from this study did not indicate that problematic feeding and sleeping co-occur in young children and further, strategies used by parents did not appear to be related specifically to problematic behaviours. The findings were, however, very interesting in as far as parent reports did not match the data obtained through the diaries and interviews. Parents stated their children did not have problematic feeding or sleeping, while the data clearly indicated that half the children had more than one problem in one or both domains. All parents tended to use a variety of strategies to adjust to their child's behaviour in both areas. Numerous strategies were used and there did not appear to be any patterns relating to strategies used where problematic behaviour was displayed. The parents were adjusting their strategies to suit the behaviours of the children. In this respect, this study has highlighted that parents will accept a certain level of problematic behaviour before labelling it or adopting a systematic approach in an attempt to modify it. Whether there are health and developmental implications of this parental approach has yet to be determined.

Further research is important and should occur with both clinical and non-clinical samples.

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APPENDIX A.

University Ethics Committee Approval

APPENDIX B.

Recruitment Flier

News Paper advertisement

Pre-school Sleep & Feeding Study

I am a student at Canterbury University currently completing my Masters thesis. My area of research includes caregivers' experiences with infant sleeping and feeding behaviours.

I am recruiting three groups

1. Caregivers with children who currently display problematic sleep

2. Caregivers with children who currently display problematic feeding

3. Caregivers of children who do are not displaying problematic sleep and/or feeding.

Child age: 24 – 48 months

Involvement will include talking with me about your experiences and the completion of questionnaires in these two areas.

Families will go into the draw to win 1 of 3 petrol vouchers valued at $100

Please feel free to contact me (Grace) for further information
027 330 1754 or 364 2987 ext 3635
gcr34@student.canterbury.ac.nz

Thank-you

Pre-school Sleep & Feeding Study

Do you have a child between 24 and 48 months?
Help with our study and go in the draw to win 1 of 3 petrol vouchers valued at $100

Please feel free to contact me (Grace) for further information
027 330 1754 or 364 2987 ext 3635
gcr34@student.canterbury.ac.nz

Thank-you

APPENDIX C.

Parent's Information Sheet and Consent Form

Pre-school Sleep and Feeding Study

To the caregivers

I am a Psychology Masters student at the University of Canterbury currently completing my thesis. My research involves gathering information on caregivers' experiences with sleeping and feeding: two common problematic areas facing parents of young children.

I will be talking to three groups of caregivers, a) caregivers whose children currently have sleep problems, b) caregivers whose children currently have feeding problems, and c) caregivers whose children currently do not have sleep or feeding problems.

I will pool the information across groups to look at trends in the data as a whole and look at common themes and concerns that arise during the interviews. This data will be written up in my thesis.

Participation in this study will involve:

- An informal interview with one or both caregivers (depending on your availability). The interview will cover information regarding your child's development.
- The completion of five questionnaires about child behaviours and parenting.
- The completion a behaviour diary for one week. This diary will record typical night-time and meal-time behaviours.

It is envisioned that the time required to complete the interview will be approximately one hour. It will take approximately 1 ½ hours to complete all five questionnaires (they need not be completed all at once).

All information gathered will be confidential and the resulting report will not contain any identifying details. No information will be released to a third party without your consent. The raw data will only be made available to you, my two supervisors and myself and subsequently destroyed at the completion of the study. The only exception to this is if I should believe that you or your child may be in danger. If this happens, professional ethics requires that I talk with my supervisor. My supervisor will then contact you and discuss what steps will be taken to ensure the child's safety.

Participation is voluntary. Should you decide to participate in my study, you have the right to withhold information and to withdraw up to the point when data collection has ended without providing a reason. There are no known risks of these evaluations. All information collected will be done with great care for you, and should not cause any upset or distress.

Thank you for taking time to consider my request. If you want to know more about this study (either now or at a later date), please feel free to contact me or my supervisors.

Grace Crandle
027 330 1754 (gcr34@student.canterbury.ac.nz)

Associate Professor Neville Blampied (University of Canterbury)
03 364 2199

Dr Karyn France
03 364-2610

This project has been reviewed and approved by the
University of Canterbury Human Ethics Committee.

Pre-school Sleep and Feeding Study
Consent Form

- I have read and understood the attached information sheet, and I have been given an opportunity to ask the researcher questions. I understand what is involved for me.

- I understand that all the information will be confidential and the written report will not contain any identifying details. The information will only be available to the participant, my supervisors and myself.

- I/we understand that I/we are free to withdraw, with our child, from the study up to the point where data collection has ended, including withdrawal of any information I/we have provided.

Caregiver/s

I/we _____ agree to participate in the research study described in the attached information sheet.

Signature_____

Date _____

Signature_____

Date _____

APPENDIX D.

Sleep Diary

Sleep Diary

Child's name_____

	Monday	Tuesday	Wednesday	Thursday
Medications/Illness				
Ideal bed-time				
Actual bed-time				
Explain if necessary				
State when put to bed	Awake Asleep	Awake Asleep	Awake Asleep	Awake Asleep
Sleep location				
No. of times out of bed during settling period				
Describe any noise during settling period e.g. crying talking, singing What did you do?				
Time from in bed to silence				
No. of times awake post-settling				
Time & duration of wakenings What did you do?	1	1	1	1
	2	2	2	2
	3	3	3	3
	4	4	4	4
	5	5	5	5
	6	6	6	6
Time up in the morning				

Key:

Sleep Diary

Child's name_____

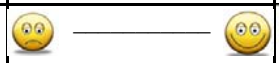
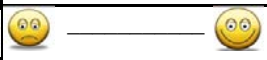
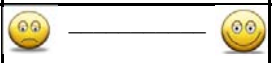
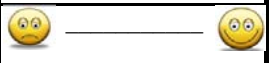
	Friday	Saturday	Sunday
Medications/Illness			
Ideal bed-time			
Actual bed-time			
Explain if necessary			
State when put to bed	Awake Asleep	Awake Asleep	Awake Asleep
Sleep location			
No. of times out of bed during settling period			
Describe any noise during settling period e.g. crying talking, singing What did you do?			
Time from in bed to silence			
No. of times awake post-settling			
Time & duration of wakenings What did you do?	1	1	1
	2	2	2
	3	3	3
	4	4	4
	5	5	5
	6	6	6
Time up in the morning			

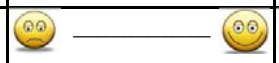
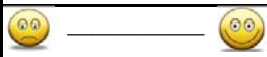
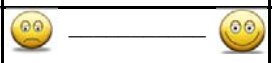
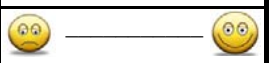
Key:

APPENDIX E.

Feeding Diary

Feeding Diary

Breakfast (time)	Monday	Tuesday	Wednesday	Thursday
Food offered				
Food consumed				
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High	Low----------High
Child behaviour e.g.	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies				
Your satisfaction Please explain				

Lunch (time)	Monday	Tuesday	Wednesday	Thursday
Food offered				
Food consumed				
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High	Low----------High
Child behaviour e.g.	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies				
Your satisfaction Please explain				

Feeding Diary

Dinner (time)	Monday	Tuesday	Wednesday	Thursday
Food offered				
Food consumed				
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High	Low----------High
Child behaviour e.g.	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies				
Your satisfaction Please explain	☹ _____ ☺	☹ _____ ☺	☹ _____ ☺	☹ _____ ☺

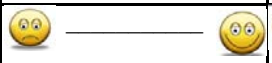
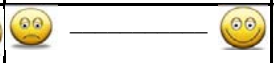
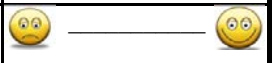
Snack (time)	Monday	Tuesday	Wednesday	Thursday
Food offered				
Food consumed				
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High	Low----------High
Child behaviour e.g.	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies				
Your satisfaction Please explain	☹ _____ ☺	☹ _____ ☺	☹ _____ ☺	☹ _____ ☺

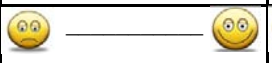
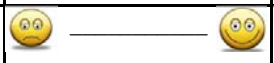
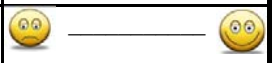
Feeding Diary

Snack (time)	Monday	Tuesday	Wednesday	Thursday
Food offered				
Food consumed				
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High	Low----------High
Child behaviour	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies				
Your satisfaction Please explain	☹ ——— ☺	☹ ——— ☺	☹ ——— ☺	☹ ——— ☺

Snack (time)	Monday	Tuesday	Wednesday	Thursday
Food offered				
Food consumed				
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High	Low----------High
Child behaviour	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies				
Your satisfaction Please explain	☺ ——— ☺	☺ ——— ☺	☺ ——— ☺	☹ ——— ☺

Feeding Diary

Breakfast (time)	Friday	Saturday	Sunday
Food offered			
Food consumed			
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High
Child behaviour e.g.	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies			
Your satisfaction Please explain			

Lunch (time)	Friday	Saturday	Sunday
Food offered			
Food consumed			
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High
Child behaviour e.g.	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies			
Your satisfaction Please explain			

Feeding Diary

Dinner (time)	Friday	Saturday	Sunday
Food offered			
Food consumed			
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High
Child behaviour e.g.	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies			
Your satisfaction Please explain	 ———— 	 ———— 	 ———— 

Snack (time)	Friday	Saturday	Sunday
Food offered			
Food consumed			
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High
Child behaviour e.g.	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies			
Your satisfaction Please explain	 ———— 	 ———— 	 ———— 

Feeding Diary

Snack (time)	Friday	Saturday	Sunday
Food offered			
Food consumed			
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High
Child behaviour	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies			
Your satisfaction Please explain	☹ _____ ☺	☹ _____ ☺	☹ _____ ☺

Snack (time)	Friday	Saturday	Sunday
Food offered			
Food consumed			
Perceived nutritional value	Good Ok Poor	Good Ok Poor	Good Ok Poor
What was the meal choice primarily based on? E.g.	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐	Nutritional value ☐ Child preference ☐ Conflict avoidance ☐
Level of conflict	Low----------High	Low----------High	Low----------High
Child behaviour	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)	Crying ☐ Food refusal ☐ Other (describe)
Your Strategies			
Your satisfaction Please explain	☹ _____ ☺	☹ _____ ☺	☹ _____ ☺

APPENDIX F.

Interview Questions

Semi-structured Interview

Start with the non-problematic area

Feeding

1. Can you tell me about your child's current feeding behaviour?
    a. Tell me about a typical meal
        i. Who is there?
        ii. What do you eat?
        iii. What does he/she eat?
        iv. How does he behave?
        v. How do you cope with this?
    b. Do you tend to offer what you would consider to be a nutritious meal or what your child would prefer?

2. How happy are you with your child's diet and feeding/eating behaviours?
    a. Would you like anything to change?
    b. Are you happy with the way your child is developing eating behaviours?
    c. Does your child eat the 'family food' at meal-times?
    d. Are you worried about how this may affect your child later?

3. What strategies are you currently using if/when problems arise?

4. Can we back-track a bit and could you tell me about your child's feeding and eating behaviours from word go
    a. Was your child breast-fed?
        i. How long?
        ii. How did that go for you and your child?
        iii. Reasons for stopping?
    b. Was your child bottle fed?
        i. How long?
        ii. How did that go?
        iii. Any allergies
        iv. Special formula?
    c. Any reason for the breast vs. bottle?

5. Tell me about the introduction of solids
    a. When did this happen?
    b. Was this transition smooth?
    c. What kinds of foods did you offer?
    d. Did you consider your child to be easy/fussy?

6. What kind of strategies did you try in order to improve any problems?
    a. What worked, what didn't?
    b. Did you seek any help?

7. When did you notice a change? (If applicable)

Sleeping

1. Tell me about your child's current sleeping, bedtime and night-time behaviour
    a. How would you describe a typical bed-time and night-time routine?
    b. How/where/when does your child fall asleep?
    c. Daytime naps?

2. What strategies do you currently use?
    a. Tell me how they are going
    b. Ho well do you feel the strategies are working? (for you and your child)

3. Are you happy with your child's bed-time and night-time behaviours?
    a. What would you like to see change?

4. Lets back-track and can you tell me about your child's sleep from the beginning
    a. Describe their sleep behaviour as a baby
        i. Where did your child sleep?
            1. Co-sleeping/cot in parents bedroom/own room
    b. How did you put your child down?
        i. Falls asleep in arms, after a feed, in buggy
    c. How was the transition from their cot to a bed?
    d. How long did you continue with night-time feedings?

5. What strategies did you try with your child to encourage good sleeping patterns?
    a. What worked/didn't work?
    b. Did you seek any help?

6. When did you notice a change? (If applicable)

APPENDIX G.

Questionnaires

1. **Eyberg Behaviour Inventory**
2. **Parent Sense of Competence**
3. **Maternal Cognitions on Infant Sleep Questionnaire**
4. **Child Feeding Questionnaire**
5. **Parent Authority Questionnaire**

Eyberg Child Behaviour Inventory

		Never	Seldom	Sometimes	Often	Always	Is this a problem?	
1	Dawdles in getting dressed	1	2	3	4	5	Yes	No
2	Dawdles or lingers at mealtimes	1	2	3	4	5	Yes	No
3	Has poor table manners	1	2	3	4	5	Yes	No
4	Refuses to eat food presented	1	2	3	4	5	Yes	No
5	Refuses to do chores when asked	1	2	3	4	5	Yes	No
6	Slow in getting ready for bed	1	2	3	4	5	Yes	No
7	Refuses to go to bed on time	1	2	3	4	5	Yes	No
8	Does not obey house rules on his/her own	1	2	3	4	5	Yes	No
9	Refuses to obey until threatened with punishment	1	2	3	4	5	Yes	No
10	Acts defiant when told to do something	1	2	3	4	5	Yes	No
11	Argues with parents about rules	1	2	3	4	5	Yes	No
12	Gets angry when doesn't get his/her own way	1	2	3	4	5	Yes	No
13	Has temper tantrums	1	2	3	4	5	Yes	No
14	Sasses adults	1	2	3	4	5	Yes	No
15	Whines	1	2	3	4	5	Yes	No
16	Cries easily	1	2	3	4	5	Yes	No
17	Yells or screams	1	2	3	4	5	Yes	No
18	Hits parents	1	2	3	4	5	Yes	No
19	Destroys toys or other objects	1	2	3	4	5	Yes	No
20	Is careless with toys and other objects	1	2	3	4	5	Yes	No
21	Steals	1	2	3	4	5	Yes	No
22	Lies	1	2	3	4	5	Yes	No
23	Teases or provokes other children	1	2	3	4	5	Yes	No
24	Verbally fights with friends his/her age	1	2	3	4	5	Yes	No
25	Verbally fights with siblings	1	2	3	4	5	Yes	No
26	Physically fights with friends	1	2	3	4	5	Yes	No
27	Physically fights with siblings	1	2	3	4	5	Yes	No
28	Constantly seeks attention	1	2	3	4	5	Yes	No
29	Interrupts	1	2	3	4	5	Yes	No
30	Is easily distracted	1	2	3	4	5	Yes	No
31	Has short attention span	1	2	3	4	5	Yes	No
32	Fails to finish tasks or projects	1	2	3	4	5	Yes	No
33	Has difficulty entertaining himself alone	1	2	3	4	5	Yes	No
34	Has difficulty concentrating on one thing	1	2	3	4	5	Yes	No
35	Is overactive or restless	1	2	3	4	5	Yes	No
36	Wets the bed	1	2	3	4	5	Yes	No

Thank you

Parental Sense of Competence

		Strongly Disagree					Strongly Agree
1	The problems of taking care of a child are easy to solve once you know how your actions affect your child, an understanding I have acquired	1	2	3	4	5	6
2	Even though being a parent could be rewarding, I am frustrated now while my child is at their present age	1	2	3	4	5	6
3	I go to bed the same way I wake up in the morning, feeling I have not accomplished a whole lot	1	2	3	4	5	6
4	I do not know why it is, but sometimes when I'm supposed to be in control, I feel more like I'm the one being manipulated	1	2	3	4	5	6
5	My mother/father was better prepared to be a good mother/father than I am	1	2	3	4	5	6
6	I would make a fine model for a new mother/father to follow in order to learn what he/she needs to know in order to be a good parent	1	2	3	4	5	6
7	Being a parent is manageable, and any problem is easily solved	1	2	3	4	5	6
8	A difficult problem in being a parent is not knowing whether you're doing a good job or a bad one	1	2	3	4	5	6
9	Sometimes I feel like I'm not getting anything done	1	2	3	4	5	6
10	I meet my own personal expectations for expertise in caring for my child	1	2	3	4	5	6
11	If anyone can find the answer to what is troubling my child, I am the one.	1	2	3	4	5	6
12	My talents and interests are in other areas, not in being a parent	1	2	3	4	5	6
13	Considering how long I have been a mother/father. I feel thoroughly familiar with this role	1	2	3	4	5	6
14	If being a mother/father of a child were only more interesting, I would be more motivated to do a better job	1	2	3	4	5	6
15	I honestly believe I have all the skills necessary to be a good mother/father to my child	1	2	3	4	5	6
16	Being a parent makes me tense and anxious	1	2	3	4	5	6
17	Being a good mother/father is a reward in itself	1	2	3	4	5	6

Thank-you

Maternal Cognitions about Infant Sleep Questionnaire

Please answer every question by circling the appropriate number

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	When my child cries at night, I think something awful may have happened to him/her	1	2	3	4	5
2	When my child wakes at night, I think I might not have fed him/her enough during the day	1	2	3	4	5
3	My child might die unexpectedly in his/her sleep	1	2	3	4	5
4	My child will feel abandoned if I don't respond immediately to his/her cry	1	2	3	4	5
5	My child might go hungry if I don't give him/her a feed at night-time	1	2	3	4	5
6	It is alright to allow my child to cry at night	1	2	3	4	5
7	When my child cries at night, I think I might lose control and harm him/her	1	2	3	4	5
8	When my child wakes at night, I think I might not have given him/her enough attention during the day	1	2	3	4	5
9	I should be getting up during the night to check that my child is still alright	1	2	3	4	5
10	If I try to resist my child's demands at night, then I think I might get very angry	1	2	3	4	5
11	When my child wakes crying, I always know what he/she needs	1	2	3	4	5
12	When my child cries at night and needs me, I wish he/she wasn't so demanding	1	2	3	4	5
13	If I try to resist my child's demands at night, then I think he/she will get more angry	1	2	3	4	5
14	When my child doesn't sleep at night, I doubt my competence as a parent	1	2	3	4	5

15	If I say no to my child's demands at night, then that means I'm a bad mother	1	2	3	4	5
16	I am able to let my child sleep on his/her own	1	2	3	4	5
17	When my child cries at night, I find myself thinking I wish I never had a child	1	2	3	4	5
18	I should respond straight away when my child wakes crying at night	1	2	3	4	5
19	I am able to resist my child's demands when he/she wakes at night	1	2	3	4	5
20	If I give up night feeding, then he/she will never sleep	1	2	3	4	5

Thank-you

Child Feeding Questionnaire

Please answer every question by circling the appropriate number

		Unconcerned	Little Concerned	Concerned	Fairly Concerned	Very Concerned
1	How concerned are you about your child eating too much when you are not around?	1	2	3	4	5
2	How concerned are you about your child having to diet to maintain a desirable weight?	1	2	3	4	5
3	How concerned are you about your child becoming overweight?	1	2	3	4	5

		Totally Disagree	Slightly Disagree	Neutral	Slightly Agree	Completely Agree
4	I have to be sure that my child does not eat too many sweets (candy, ice-cream, cake, biscuits)	1	2	3	4	5
5	I have to be sure that my child does not eat too many high-fat foods	1	2	3	4	5
6	I intentionally keep some foods out of my child's reach	1	2	3	4	5
7	I offer sweets (candy, ice-cream, cake, biscuits) to my child as a reward for good behaviour	1	2	3	4	5
8	I offer my child her favourite foods in exchange for good behaviour	1	2	3	4	5
9	If I did not guide or regulate my child's eating she would eat too much of her favourite foods	1	2	3	4	5
10	My child should always eat all the food on her plate	1	2	3	4	5
11	I have to be especially careful to make sure my child eats enough	1	2	3	4	5
12	If my child says 'I'm not hungry', I try to get her to eat anyway	1	2	3	4	5
13	If I did not regulate my child's eating, she would eat much less than she should	1	2	3	4	5

		Not at all				Very
14	How responsible do you feel you are for your child's diet and eating?	1	2	3	4	5
15	How closely do you feel you monitor your child's diet and eating?	1	2	3	4	5

Thank-you

Parental Authority Questionnaire

Please answer every question by circling the appropriate number

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	I feel that in a well-run home, a child should have his/her own way as often as parents do	1	2	3	4	5
2	Although my child does not always agree with me, I often insist that he/she conform to what I think is right	1	2	3	4	5
3	When I ask my child to do something, I expect him/her to do it immediately without asking any questions	1	2	3	4	5
4	Once family policy has been established, I discuss the reasoning behind the policy with my child	1	2	3	4	5
5	I encourage verbal give-and-take whenever my child feels that family rules and restrictions are unreasonable	1	2	3	4	5
6	I feel my child needs to be free to make up his/her own mind and to do what he/she wants to do, even if I don't agree	1	2	3	4	5
7	I do not allow my child to question any decision I make	1	2	3	4	5
8	I tend to direct the activities and decisions of my child through reasoning and discipline	1	2	3	4	5
9	I feel parents should use more force than they often do in order to get their children to behave the way they are supposed to	1	2	3	4	5
10	I do not feel that my child needs to obey rules and regulations simply because someone in authority has established them	1	2	3	4	5
11	I let my child know what I expect in the family, but am open to discuss these expectations when he/she feels they are unreasonable	1	2	3	4	5
12	I feel that a wise parent teaches his/her child early just who is boss in the family	1	2	3	4	5
13	I think it is best to avoid giving children specific expectations and guidelines for their behaviour	1	2	3	4	5
14	I tend to do what my child wants when making family decisions	1	2	3	4	5
15	I believe that the direction and guidance I give my child is consistent, rationale and objective	1	2	3	4	5
16	I tend to get upset if my child tries to disagree with me	1	2	3	4	5
17	I feel that most problems in society would be solved if parents would not restrict their child's activities, decisions, and desires as they are growing up	1	2	3	4	5
18	I let my child know what behaviour is expected, and if my child does not meet those expectations, I punish him/her	1	2	3	4	5

19	I allow my child to decide most things for him/herself without a lot of direction from me	1	2	3	4	5
20	I take into consideration my child's opinions when making family decisions, but I do not decide something simply because he/she wants it	1	2	3	4	5

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
21	I do not feel it is my responsibility to direct and guide my child's behaviour as he/she is growing up	1	2	3	4	5
22	I have clear standards of behaviour for my child, but I am willing to adjust those standards to the needs of my child	1	2	3	4	5
23	I expect my child to follow my directions regarding his/her behaviour and activities, but I am also willing to listen to his/her concerns and discuss those directions	1	2	3	4	5
24	I allow my child to form his/her own opinions regarding family matters and, generally, allow my child to decide what he/she is going to do	1	2	3	4	5
25	I have always felt that most problems in society would be solved if we could get parents to strictly and forcibly deal with their children when they fail to do what they are supposed to do	1	2	3	4	5
26	I often tell my child exactly what I want him/her to do and how I expect my child to do it	1	2	3	4	5
27	I often give my child clear direction for his/her behaviours and activities, but I am also understanding when my child disagrees with me	1	2	3	4	5
28	I do not attempt to direct the behaviours, activities and desires of my child	1	2	3	4	5
29	My child should know what I expect of him/her and to conform to those expectations simply out of respect for my authority	1	2	3	4	5
30	If I make a decision that hurts my child, I am willing to discuss that decision and to admit to any mistakes	1	2	3	4	5

Thank-you